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TECHNICAL REPORT 54-43

**HANDBOOKS OF INSTRUCTIONS FOR  
USAF EQUIPMENT DESIGNERS**

**BECKER AND BECKER ASSOCIATES**

**APRIL 1954**

**WRIGHT AIR DEVELOPMENT CENTER**

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WADC TECHNICAL REPORT 54-43

**HANDBOOKS OF INSTRUCTIONS FOR  
USAF EQUIPMENT DESIGNERS**

*Becker and Becker Associates*

*April 1954*

*Handbook Branch  
Directorate of Engineering Standards  
Contract No. AF 33(616)-2102  
RDO No. 657-442*

**Wright Air Development Center  
Air Research and Development Command  
United States Air Force  
Wright-Patterson Air Force Base, Ohio**

McGregor & Werner, Inc., Dayton, Ohio  
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## FOREWORD

This program was initiated by the Handbook Branch, Directorate of Engineering Standards, Wright Air Development Center, Wright-Patterson Air Force Base, Ohio. The engineering study upon which the report is based was accomplished by Becker and Becker Associates of New York, New York, under Air Force Contract No. AF 33(616)-2102, Res. and Dev. Order No. 657-442, "Handbooks of Instructions for USAF Equipment Designers." Lt. Col. R. W. Barnes, Chief of the Handbook Branch, was Chairman of the handbook task groups responsible for the engineering study. Mr. David Benjamin of Becker and Becker Associates was the Project Director in charge of the work covered under Contract AF 33(616)-2102.

Included among those who cooperated in the engineering study and the preparation of the report were: Mr. Nathaniel Becker, Mr. Jules Becker, Mr. Brian Copping, Mr. Felix Gilbert, Mr. Frederick H. Leigh, Mr. Joseph M. Parriott, and Mr. Eric J. Young of Becker and Becker Associates; Major James E. Miller, Mr. T. M. Hay and Mr. C. H. Martens of the Handbook Branch, Directorate of Engineering Standards, Wright Air Development Center. Acknowledgment is made of the assistance provided by the personnel of the Equipment Laboratory and other agencies of Wright Air Development Center, other ARDC centers, and of the aircraft industry.

## ABSTRACT

With the exception of the Handbook of Instructions for Aircraft Designers, requirements for equipment designed and procured for use by the United States Air Force are not at present centralized. Two additional handbooks were directed: Handbook of Instructions for Ground Equipment Designers and Handbook of Instructions for Designers of Pilotless Aircraft and Guided Aircraft Rockets. Early attempts to define their coverage specifically were arbitrary and incomplete. To assure that the investment in preparation and maintenance of these volumes was properly directed, overall delineation of technical responsibility and functions was required.

The total area of USAF technical responsibility is determined by analysis of the missions and responsibilities of all USAF Commands and Services, and by listing all the functions to be covered in the execution of the various missions. A plan is presented which precisely and fully defines HIGED and HIDPAGAR, and the companion HIAD. Also developed are shorter but precise definitions of those areas not covered by design handbooks, to insure that the present volumes, and possible future volumes, will not conflict with or duplicate one another. An associated format manual provides a standard format for all design handbooks.

## PUBLICATION REVIEW

This report has been reviewed and is approved.

FOR THE COMMANDER:



ROBERT A. BARRERE  
Colonel, USAF  
Director of Engineering Standards

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## SECTION I

### BACKGROUND

The handbooks which form the major subject of this technical report are of the type defined as "Military Requirements Handbooks." Definitions of this type of handbook and of "Design Technique and Data Handbooks" are given herewith for comparison purposes:

**Military Requirements Handbooks** - Publications which reference, summarize, consolidate, and explain the requirements governing the design of equipment for the USAF. These requirements may range from technical details to information concerning tactical utilization; they may be explained by experience, supported by statements of policy, or otherwise by authoritative data.

**Design Technique and Data Handbooks** - Publications which explain, summarize, consolidate, and reference data concerning detail design and design techniques, considering principally the natural or physical problems of design, not those imposed by eventual specific military uses to which equipment may be put. Such publications provide basic information to improve and aid in detail design, but do not state the military requirements which the design must meet.

With few exceptions, the design requirements for all types of USAF equipment are available at the present time. The information, however, includes conflicting material; is of varying degrees of completeness; and is buried within official specifications and standards (which occupy approximately 33 linear feet of shelf space), Armed Services Technical Information Agency publications and reports (which number approximately 183,000), technical papers (of which there are many thousands in existence), technical journals (53 are pertinent), technical orders and catalogs (which occupy approximately 40 linear feet of shelf space), and directives and findings of groups and committees (these are numerous, but difficult to locate). In addition, there is a great reservoir of information in the minds of individuals, particularly those individuals in the USAF who have been responsible for handling Unsatisfactory Reports, and Research and Development projects.

The time required and the cost involved in locating applicable information under existing circumstances are both uneconomical and burdensome. Designers of equipment and USAF Research and Development and Procurement Agencies who need such information are faced with an almost impossible task. Even when all the guidance material pertinent to a design problem is compiled, its application is limited to that particular problem, and the effort expended must be repeated for every new problem that arises.

To avoid the requirement for repeated searching, locating, ordering, and compiling pertinent data, it would be advantageous to compile the available material in centralized, easily referenced form, that would lend itself to constant revision. This form of summarized design guidance material would be of particular advantage in orienting new personnel both in the USAF and industry.



As the state of the art progresses, the technology becomes, by geometric proportions, more complicated and extensive. Thus, as aircraft (manned and unmanned) are designed for higher speeds, higher altitudes, increased automatization, the need for making available to designers a centralized source of design guidance becomes more and more pressing.

To solve these problems of design guidance, HQ ARDC directed that WADC prepare a Handbook of Instructions for Ground Equipment Designers (HIGED) and a Handbook of Instructions for Designers of Pilotless Aircraft and Guided Aircraft Rockets (HIDPAGAR).

Becker and Becker Associates were awarded a contract on 15 May 1953, to provide engineering and research services to determine and define the scope and composition of a manual to be entitled, "Handbook of Instructions for Ground Equipment Designers," and to prepare an outline of its contents. A preliminary outline was presented to the handbook task group on 10 August 1953.

In the early stages of the project, it was readily apparent that the term "ground equipment" implied all equipment except that installed in aircraft; and any handbook to be prepared on this basis would involve a far greater expenditure of funds and a much longer period of time than had been originally contemplated.

Furthermore, any interpretation of "ground equipment," other than a literal one as it applied to the handbook, necessitated a definition. Not only were there many difficulties in creating such a definition, but the process brought to light new problems. The definition obviously had to be such that there would be no conflict between the scope of HIGED and the scope of the existing HIAD. Nor should there be conflict between their scopes and that of HIDPAGAR, which was then being planned.

A definition, developed solely for the purpose of delineating the scope of HIGED, would have to be modified frequently. Each time in the future when a new system or item for which specific provision had not been made in the original definition would come under consideration, a "reworking" of the definition would be necessary.

It was also recognized that the three handbooks (i.e. one concerning ground equipment, one concerning the design of piloted aircraft and one concerning the design of pilotless aircraft) did not provide coverage over the complete zone of USAF responsibility, for neither HIAD nor HIDPAGAR were expected to include the design of systems installed in aircraft, but only the installation of such systems.

To arrive at a logical definition of scope for HIGED, HIDPAGAR and the then existing HIAD, it would be essential to study first the coordinated whole (the entire area of USAF technical responsibility) in order to arrive at a coordinated part (the area or scope of an individual handbook). Investigation of the total area of USAF technical responsibility, followed by delineation of individual handbook scope within the total area, represents the "systems-engineering" approach; whereas direct delineation of individual handbook scope can only result in a hit-or-miss solution in each case, with all the problems of duplication and conflict, voids in coverage, and lack of standardization between handbooks unresolved.

It is emphasized that establishing a master plan for a complete series of handbooks does not imply that such a series must ever be written. Wherever attention was given in the study to areas and handbooks other than those specifically directed, it was done only for two reasons:

1. Because data handling is a pressing and growing problem, and the need for data consolidation is rapidly increasing; the possibility of added handbooks, therefore, had to be assumed.
2. To provide a means whereby specific handbooks to be written may be prepared within a coordinated, logical, long-range and complete framework.

## SECTION II

### OBJECTIVES

Thus the need for an overall study, with the following broad objectives, became manifest:

1. The original objectives, which resulted in the directive to write HIGED:
  - a. To summarize the basic USAF requirements for each type of system or equipment involved.
  - b. To provide complete references to data bearing on each type of system or equipment involved.
  - c. To summarize and preserve experience data concerning each type of system or equipment involved.
  - d. To provide inter-system coordination with a view toward standardization, thus extending the existing intra-system control provided by the Weapon System Concept.
  - e. To provide a means for cross-checking, correlating and coordinating information by presenting many USAF requirements in compact, easily usable form.
  - f. To present the designer with background information, ranging from technical details to information concerning tactical utilization, so that he might design from a systems rather than an equipment viewpoint.
2. The additional objectives which came to light as a result of the work performed in connection with HIGED:

- a. To provide a framework which would allow the preparation of new design handbooks, when and if needed, in a logical, consistent, and orderly manner.
- b. To minimize duplication of material between such handbooks.
- c. To provide well delineated areas within which future handbooks might be written without mutual conflict.

### SECTION III

#### DISCUSSION

The original contract with Becker and Becker Associates was amended as of 1 September 1953, to cover engineering services to prepare a complete technical plan for integrated and complementary handbooks of instructions for USAF equipment designers. The scope of the amended contract as specified in Exhibit WCXH 53-1 involves the following:

- 1. Organization of a basic plan to guide in the definition of the boundaries of possible design guidance handbooks.
- 2. Inclusion in the plan of methods to implement the Weapon System Concept.
- 3. Inclusion in the plan of methods to allow for government and industry publications now planned or in existence.
- 4. Preparation of documents defining format and mechanics of design guidance handbooks.
- 5. Preparation of documents defining the boundaries of a "Handbook of Instructions for Ground Equipment Designers (HIGED)," a "Handbook of Instructions for Designers of Pilotless Aircraft and Guided Aircraft Rockets (HIDPAGAR)," and providing for revision of the "Handbook of Instructions for Aircraft Designers (HIAD)."
- 6. Preparation of documents briefly defining the boundaries of areas which could be covered by additional design handbooks, when and if requirements therefor are established by the USAF.

In order to establish the boundaries of the total area of USAF technical responsibility, consideration was given to the possibility of utilizing the Status of USAF Equipment Book, supply catalog index, and similar equipment listings, but it was found that these would not provide long term validity, since equipment is in a constant state of flux. Because functions continue even though equipment changes, it was decided that an analysis of the functions of the USAF would provide the only reliable method for establishing the boundaries of the area of USAF technical responsibility.

For example, the USAF has a technical responsibility in the area of communications. Organization of a portion of the fundamental plan on the basis of the function of communicating, has long term validity (the function of communicating has existed from prehistoric times and undoubtedly will continue to exist well into the future). Organization of a portion of the fundamental plan on the basis of today's communications equipment, however, would deny long term validity to the plan (today man employs radio, telephone, teletypewriter; in the past he employed pigeons, signal flags, smoke, signal drums, the runner at Marathon; we cannot conceive what he may use in the future).

The missions and responsibilities of all types of USAF commands and services were examined with a view to ascertaining the particular functions for which each was responsible, together with the types of equipment which would be required to perform each function. The pertinent documents which were examined are listed in Appendix I, "List of Pertinent Documents," and the lists of functions which were prepared are included in Appendix II, "Functional Implications."

An analysis of all the functions that had been listed indicated that certain functions could be included within broader functions. Multiple appearances were eliminated. Although certain functions were self-explanatory in relation to the types of equipment involved, it was found necessary to clarify others by adding modifiers. It was considered necessary to break down "Ground Support of Functional Items," (see Appendix III) into thirty-eight minor functions in order to provide a better guide. The result of the analysis was, therefore, a compromise in regard to the breadth of functions, and in some instances types of equipment were listed rather than functions.

In order to be effective, the list of functions used to establish the boundaries of the total area of USAF technical responsibility had to be as nearly complete as possible. The list of functions resulting from the analysis of the functional implications was, therefore, subjected to a check with four different sources of material which were:

1. ARDC Status of USAF Equipment Book
2. Defense Supply Management Agency Letter, "Assignment of Areas of Responsibility for Standardization," dated 19 August 1953
3. TO 00-35A-1, Classification of USAF Equipment and Supplies
4. "Exhibit 1, Priorities and Allocations Manual," dated 16 September 1952, issued by the Munitions Board, Department of Defense

In each case, the types of equipment listed were checked against the list of functions to insure that a function was listed which would provide a logical location for each type or class of equipment.

As a result of the check, some changes were made in the list of functions to take care of ambiguities, and several items were added to make the list complete. The final list of functions constituting the total area of USAF technical responsibility is given in Appendix III, "List of USAF Functions."

Having established the total area of USAF technical responsibility as the total of all functions for which the USAF has a responsibility, it was necessary to divide this total area into smaller areas within which homogeneous and related functions would be included.

The material to be handled to define all requirements is the same, whether it is considered as a single handbook published in the form of a number of volumes, or as a multitudinous number of separate handbooks, each dealing with a single type of equipment. The latter possibility was discarded, but consideration was given to a single handbook. Division of the total area into suitable handbook areas must be accomplished on the basis of either systems and equipment, or functions. In each case, a number of different arrangements are possible.

In order to obtain a fair evaluation of the different breakdown possibilities, seven preliminary plans were developed; as shown in Table I and described in detail in Appendix IV.

**TABLE I - PRELIMINARY PLANS**

Plan	Type	No. of Handbooks	Basis
A	Organizational	7	Industrial Organization
B	Organizational	4	Prime and Sub-Contractor Responsibilities
C	Functional	9	List of USAF Functions (Appendix III)
D	Functional	14	Armed Services Technical Information Agency Distribution List
E	Functional	20	ARDCM 80-4 "Programming Procedures" Technical Groups
F	Organizational	10	Air, Personnel and Ground Groupings
G	Functional	24	Functions and Systems

Each preliminary plan was evaluated on the basis of ten criteria, described in Table II. The analysis of each plan is summarized in Appendix V and the results, tabulated for comparison purposes, are shown in Table III.

**TABLE II - CRITERIA FOR HANDBOOK PLAN EVALUATION**

Criterion	Remarks
1. All Inclusiveness	The sum of the contents of the handbook areas within the plan should provide for design guidance concerning every existing type of USAF equipment, and provide a place for design guidance concerning future USAF equipment.
2. Minimum Repetition	In so far as possible, subject matter should be limited to inclusion in only one handbook.
3. Maximum Guidance in Minimum Number of Handbooks	The plan should provide for individual handbook content to be such that any contractor will find maximum guidance within his field of interest in a minimum number of handbooks.
4. Self-Evident Contents	The breakdown of the plan should be such that the identification of content of individual handbooks would be self-evident. Titles should be as self-defining as possible.
5. Independence from Changing Factors	The plan should have long term validity and be independent of factors which are liable to change with time and the state of the art.
6. Reasonable Number of Handbooks	The number of individual handbooks included in the plan should be held within reasonable limits.
7. Homogeneity of Content	The content of individual handbooks must be reasonably homogeneous, particularly from the standpoint of the ultimate user.
8. Provision for Adding Material	The plan should provide for the necessity of adding guidance information in its logical place as the state of the art progresses.
9. Distribution System	The plan should lend itself to a reasonable distribution system, so as to result in minimum publication cost and subsequent maintenance.
10. Centralization of Information	The plan should provide for treatment of systems, sub-systems, equipment and accessories, components, etc., in such a way that information will be centralized to the maximum extent possible.

**TABLE III - COMPARISON OF PLANS "A" THROUGH "G"**

Criterion	Plan						
	"A"	"B"	"C"	"D"	"E"	"F"	"G"
1. All Inclusiveness	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2. Minimum Repetition	Yes	Yes	Yes	Yes	No	Yes	Yes
3. Maximum Guidance in Minimum Number of Handbooks	No	No	Yes	Yes	No	No	No
4. Self-Evident Contents	No	No	No	Yes	No	No	No
5. Independence from Changing Factors	No	No	Yes	Yes	Yes	No	Yes
6. Reasonable Number of Handbooks	7	4	9	14	20	10	24
7. Homogeneity of Content	No	No	Yes	Yes	Yes	No	No
8. Provision for Adding Material	No	Yes	Yes	Yes	Yes	No	Yes
9. Distribution System	Yes	Yes	Yes	Yes	No	Yes	No
10. Centralization of Information	Yes	Yes	Yes	Yes	No	Yes	Yes

Following the evaluation and comparison of the various preliminary plans, several composite plans were developed with the objective of including the advantages while disposing of the disadvantages of the preliminary plans.

The final composite plan, thus derived, became the "Master Plan for Design Handbooks" (Appendix VI) which contains the following features:

1. Instead of considering each of the sub-divisions as a "Handbook Area," the sub-divisions are designated, "Technical Areas." Within each technical area one or more separate handbooks might be written.
2. The support for any equipment and the supported equipment itself are in the same technical area.

3. To minimize duplication, a superstructure is created, and designated the "General Information Area." This area includes that common material, having an across-the-board application, which would otherwise have to be repeated in all or many of the individual handbooks. Examples of such across-the-board information are:

- a. General design procedures
- b. Human engineering, safety, mobility, transportability, environmental data
- c. Information concerning common components and parts

The "Master Plan for Design Handbooks" consists of a general information area and the following eleven technical areas:

1. Sustained Flight
2. Communication and Navigation
3. Armament
4. Photographic and Recording
5. Training
6. Meteorological
7. Administration, Supply, and Transportation
8. Rescue, Aerial Delivery, and Personal Equipment
9. General Base Installations
10. Operational Suitability Test, and Research and Development
11. Medical

Within these areas are allocated all the functions which are included within the boundaries of the total area of USAF technical responsibility.

Both HIAD and HIDPAGAR are included within the Sustained Flight Technical Area. Since these two handbooks do not include all the functions within the technical area, provision is made for additional handbooks. Providing for these additional handbooks is not intended to imply that they must be written but does further the delineation of scope of HIAD and HIDPAGAR. The handbooks within this area in the Master Plan are, therefore, as follows:

1. Handbook of Instructions for Aircraft Designers (HIAD)
2. Handbook of Instructions for Designers of Pilotless Aircraft and Guided Aircraft Rockets (HIDPAGAR)
3. Handbook of Instructions for Propulsion Equipment Designers (HIPED)
4. Handbook of Instructions for Aircraft Support Equipment Designers (HIASED)

Complete implementation of the Master Plan would provide consolidated design guidance concerning all USAF equipment. This would involve a lengthy and costly program, the economy of which is questionable. Moreover there is no present indication that any handbooks other than HIAD, HIDPAGAR and a handbook concerning ground equipment will be written in the foreseeable future. To furnish, at an early date and at reasonable cost, "most needed" guidance concerning ground equipment, an interim plan was developed.



The material to be included within this interim handbook is arranged in such a manner that a complete chapter may be removed when and if additional design handbooks are published. When and if all such chapters are removed, the remaining general design data will provide a nucleus for the General Information Area.

Existing and contemplated designers' handbooks were the subject of another phase of the project. While the existence of a number of "Design Technique and Data" type handbooks was noted, the only existing handbook of the "Military Requirements" type is the Handbook of Instructions for Aircraft Designers.

Several contemplated publications, however, appear to be relevant, and should be considered (if then available) in connection with the writing of any USAF designers' handbooks. These include:

1. Visual Presentation of Information by C. A. Baker and W. F. Grether. This will be published as a WADC Technical Report, by Aero Medical Laboratory.
2. WADC TR 54-132, Effect of Climate and Environment on Ground Support Equipment (in preparation).
3. WADC TR 54-133, Environmental Criteria for Ground Support Equipment (in preparation).

Concurrently with the study involving the technical areas and master handbook plan, an additional study was in progress to determine a general format and method of presentation to allow design handbooks to be prepared, revised, distributed, and used in the least costly, simplest, and most effective way possible. Text preparation, make-up, basic numbering, references, illustrations, preparation of reproducible copy, format requirements, printing and binding, revision system, and distribution were standardized.

The results of this format study have been prepared in manual form under the title, ARDCM 5 - ( ), "Manual for General Preparation of ARDC Equipment Designers Handbooks (Draft)." \*

Some of the features of the manual are:

1. Provision for numbering pages, illustrations, tables, sections, and paragraphs, within individual chapters, in order to avoid complications in referencing and pagination resulting from revisions and reissues.
2. Provision for a unique type of revision half-sheet insert and the identification thereof to reduce costs of preparing and distributing revision material. This system makes it unnecessary to "freeze" copies of the handbook as of any certain date to administer multiple contracts with different dates of effectivity. Individual pages are not removed at any time. Complete sections or chapters will be revised and reissued as units when the quantity of material inserted dictates. The original material will be removed as a consequence of reissue and may be maintained in a separate binder for the administration of

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\*Copies of this manual and the exhibits referenced in this technical report may be obtained upon application to: Commander, Wright Air Development Center, Wright-Patterson Air Force Base, Attention: WCXH.

contracts dated prior to the major revision date.

3. Provision for standardization of tabbed dividers, heads, folios, and chapter numbering to simplify use of handbooks.
4. Provision for seven-hole page punching to permit use of two, three, or seven ring binders.
5. Provision for standardization of handbook make-up to permit use of simple production equipment for preparing initial reproducible copy and subsequent revision material at low cost.
6. Provision for a cross-referencing system to avoid the necessity of revising text references when applicable specifications, publications, and extract sources are changed. This also permits easy location of referenced material within the text for revision purposes.
7. Provision for decalcomania type binder labels to avoid the necessity of imprinting binders and to provide identification material for users who must provide their own handbook binders. Not only is initial cost of decalcomania low, but in the event of title or terminology change, a low cost decalcomania can be provided rather than an expensive new binder.

In connection with this project, the following exhibits were prepared:

1. Exhibit WCXH 53-2, Handbooks of Instructions for USAF Equipment Designers (General Organization). This exhibit sets forth the general requirements for organization, scope, contents, format, and procedures for preparation of equipment designers' handbooks. It includes a complete description of the master plan, including a list of the functions applicable to each of the handbooks defined within the sustained flight technical area, and the functions applicable to each of the other technical areas, together with a list of design factors.
2. Exhibit WCXH 53-3, Handbook of Instructions for Ground Equipment Designers (Scope and Outline). This exhibit sets forth the detailed organization, scope, format, and procedures for preparation of the interim handbook which is intended to fill the requirement for guidance in design of USAF ground equipment in a minimum of time and at a reasonable cost. It includes a complete description of the interim plan, together with a proposed outline of contents.
3. Exhibit WCXH 53-6, Handbook of Instructions for Designers of Pilotless Aircraft and Guided Aircraft Rockets (Scope). This exhibit sets forth the scope, format, and procedures for the preparation of this handbook. The exhibit includes a proposed outline of contents.
4. Exhibit WCXH 53-7, Handbook of Instructions for Aircraft Designers (Scope). This exhibit sets forth the detailed requirements for organization, scope, format, and procedures for a revision of the existing handbook to conform with the master plan resulting from the engineering study, and the proposed format for design requirements handbooks. The exhibit includes a proposed outline of contents.

5. Exhibit WCXH 53-8, Handbook of Instructions for . . . . Designers (Scope). This exhibit was prepared to provide a basic form for the preparation of definitive exhibits for design handbooks which may be required in the future. Blanks, such as in the title, are provided for the insertion of applicable information. The exhibit was prepared in this form because, although Exhibit WCXH 53-1 required definitive exhibits to be prepared for each handbook, specific handbooks have not been defined, except those within the Sustained Flight Technical Area. When and if handbooks are required to be written within, or encompassing, any other technical area, Exhibit WCXH 53-8 can be made applicable to the particular subject matter by completing the blank spaces in the title and text as required.

Because the outline for the original HIGED (which was presented in preliminary form to the Task Group in August of 1953, as mentioned earlier in this report) was found to correspond closely in scope to that of the newly defined Handbook of Instructions for Aircraft Support Equipment Designers (HIASED), the applicable portions were retained and submitted to the procuring agency under the title, "Outline for Handbook of Instructions for Aircraft Support Equipment Designers," dated 17 December 1953.

#### SECTION IV

#### CONCLUSIONS

As a result of the engineering study, the following conclusions were reached:

1. The "Master Plan for Design Handbooks" defines present and possible future volumes logically and with long-range validity. The technical areas in the master plan are defined so that they may be separated into handbook areas, which will not conflict with or duplicate one another.
2. The proposed format manual will standardize format and revision details and minimize cost of preparation and distribution.
3. The exhibits will provide the necessary control over the preparation of handbooks conforming to the master plan and the format manual.
4. Because the field of ground equipment is so highly diversified, and because of the numerous types of equipment involved, complete design guidance for any particular type of equipment will not be available until a handbook is published which includes that particular type of equipment. The Handbook of Instructions for Ground Equipment Designers is therefore organized on an "interim" basis to encompass the entire field briefly, so that the most needed information can be made available at an early date and at moderate cost.

APPENDIX ILIST OF PERTINENT DOCUMENTS

The following documents which have a bearing on the delineation of overall scope of potential USAF handbooks were examined:

AFR's 5-10*	AFR's 35-400	AFR's 91-7	AFL's 121-30
5-15*	35-405	91-8	136-3
5-17*	35-447	91-9	150-3
5-21*	50-19	91-10	
5-23*	50-27	91-11	AFM's 32-3
5-25*	60-5	91-13	75-4
5-43*	60-23	91-14	77-1
5-47*	65-17	91-15	79-3
6-5*	65-31	91-16	90-4
11-9*	65-33	91-17	
11-11*	65-61	93-1	AFP 5-1-1
14-4	65-80	93-17	
20-2	65-89	93-21	AMCM's 5-1*
20-4	66-14	100-1	5-3
20-5	67-70	100-12	67-3
20-6	71-1	100-16	67-6
20-7	71-6	100-32	160-2
20-13	80-4	100-48	
20-15	80-6	105-3	AFB No. 1, 1948
20-30	80-8	136-1	No. 4, 1948
20-33	80-13	136-6	
20-42	80-14	136-7	AC and SS
20-51	80-15	136-8	Pamphlets
20-54	80-18	145-11	2
20-68	80-21	146-3	13
21-10	80-22	148-1	20-1
23-1	80-27	160-3	30
23-2	80-29	160-7	31
23-3	85-6	160-29	32
23-6	85-8	160-108	33
23-8	85-10	160-112	34
23-9	85-21	170-12	35
23-10	86-2	355-4	36
23-12	86-3	400-1	37
23-14	86-4	400-3	43
23-15	86-5		44
23-17	86-6	AFL's 64-4	45
24-1	88-10	67-3	65-1
32-3	91-1	67-9	
32-6	91-4	67-13	AF Master Equipment
32-8	91-6	67-14	Authorisation List

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\* Used in connection with format

## FUNCTIONAL IMPLICATIONS

### APPENDIX II

The missions and responsibilities of the various commands and services listed below and detailed in this appendix were examined with a view to preparing a list of all their functional implications:

- (1) Strategic Air Command
- (2) Tactical Air Command
- (3) Air Defense Command
- (4) Continental Air Command
- (5) Air Materiel Command
- (6) Air Research and Development Command
- (7) Air Training Command
- (8) Air Proving Ground Command
- (9) Air Transport Service
- (10) Security Service
- (11) Medical Service
- (12) Air University
- (13) USAF Bases
- (14) Air Intelligence
- (15) Support of Functional Items

## STRATEGIC AIR COMMAND

### FUNCTIONAL IMPLICATIONS OF STRATEGIC AIR WARFARE

#### 1. DEFINITIONS

- a. Strategic Air Warfare.- Air combat and supporting operations designed to effect, through the systematic application of force to a selected series of vital targets, the progressive destruction and disintegration of the enemy's war-making capacity to a point where he no longer retains the ability or the will to make war. Vital targets may include key manufacturing systems, sources of raw material, critical material, stock piles, power systems, transportation systems, communications facilities, concentrations of uncommitted elements of the enemy armed forces, key agricultural areas, and other such target systems. (AF Bul 1, 1948)
- b. Strategic Air Operations.- Air operations aimed at the destruction and dislocation of the enemy's military, industrial, political, and economic system, and the undermining of his morale to the point where his capacity for armed resistance is fatally weakened. (AC & SS Pamphlet No. 35, page 2, chapter 1, July 1950)
- c. Strategic Air Operations.- Air Operations contributing to the conduct of strategic air warfare. (AF Bul 1, 1948)

#### 2. MISSION OF USAF STRATEGIC AIR FORCES

To conduct strategic air operations as defined above.

#### 3. RESPONSIBILITIES OF USAF STRATEGIC AIR FORCES

- a. Constant readiness
- b. Capacity to perform
  - (1) Strategic bombardment
  - (2) Interdiction of enemy sea power
  - (3) Anti-submarine operations and shipping protection
  - (4) Aerial mine laying
  - (5) Strategic reconnaissance
    - (a) Electronic
    - (b) Weather
    - (c) Visual
    - (d) Aerial photographic
    - (e) Aeronautical charting
    - (f) Cartography
  - (6) Escort fighter operations
  - (7) Specialized transport operations

#### 4. GENERAL SUPPORT REQUIRED

##### a. Intelligence

- (1) Air order of battle
- (2) Maps and charts
- (3) Enemy capabilities and equipment
- (4) Experience and morale of enemy forces
- (5) Enemy defense system
- (6) Enemy target system data
- (7) Weather data
- (8) Enemy reaction to attack

##### b. Personnel

- (1) Air crew
- (2) Support

##### c. Support for functional items

- (1) Ground
- (2) Air

##### d. Communications, control, and signalling, general purpose

##### e. Navigation and flight control, general purpose

##### f. Weather service

##### g. Bases, with all facilities and utilities for personnel and equipment, plus defensive capability

##### h. Logistic support

- (1) Reporting of needs
- (2) Supply system
- (3) Transportation; air, sea, land
- (4) Handling, storage and distribution

##### i. Emergency capabilities

- (1) Communication and location
- (2) Rescue system
- (3) Survival
- (4) Evasion and escape

##### j. Air crew support

- (1) Clothing
- (2) Food
- (3) Escape (air)
- (4) Protection
- (5) Services

k. General personnel support

- (1) Clothing
- (2) Services
- (3) Food
- (4) Protection
- (5) Medical

l. Training

5. COMPONENT FORCES REQUIREMENTS

a. Strategic bombardment forces

(1) Weapon carriers

- (a) Manned
- (b) Unmanned

(2) Penetration capability

(a) Minimize interception

- 1 Speed or altitude
- 2 Deception
- 3 Surprise (prevent detection)
- 4 Spoofing and jamming
- 5 Diversion

- a. Diversionary efforts
- b. Attack simulation

(b) Minimize time over defended territory

- 1 Speed
- 2 Use of fast parasite carriers or missiles

(c) Defend against interception

- 1 Guns
- 2 Missiles
- 3 Fire control
- 4 Spoofing and jamming
- 5 Erection of false targets and influences
- 6 Evasive action
- 7 Escort
- 8 Passive

- a. Camouflage
- b. Armor



(3) Weapons, strategic

- (a) Nuclear
- (b) High explosive
- (c) Bacteriological
- (d) Chemical
- (e) Psychological

(4) Weapons, anti-seapower

(5) Weapons launching or release (air)

(6) Weapon aiming and guidance

(7) Target location, identification, and marking

(8) Control, communication, navigation

- (a) Air to ground, ground to air communications
- (b) Air to air communications
- (c) Airborne identification, detection, warning
- (d) Escort or defensive missile control
- (e) Security and counter measures
- (f) Navigation
- (g) Landing and traffic control
- (h) Station keeping

(9) Weapon selection

- (a) Target analysis
- (b) Computation of weapon effectiveness
- (c) Computation of operational conditions

- 1 Carrier characteristics
- 2 Attack methods
- 3 Weather
- 4 Base or launching site characteristics

(10) Assessment of results

- (a) Data gathering
- (b) Data analysis

(11) Range, provisions for

- (a) Towing or coupling
- (b) Refueling

(12) Mobility, provisions for

- (a) Preparations of bases
- (b) Mobility of essential equipment
- (c) Transport force and equipment

(13) Special support

- (a) Intelligence
- (b) Personnel

- (c) Support for functional items
- (d) Weather service
- (e) Bases; facilities; utilities; defense
- (f) Logistic support
- (g) Emergency capabilities
- (h) Air crew support
- (i) General personnel support
- (j) Training

b. Strategic reconnaissance forces

- (1) Mission.- Collection and technical evaluation, interpretation, and dissemination of information about the enemy's installations, defenses, dispositions, and capabilities.
- (2) Requirements

(a) Carriers

- 1 Manned
- 2 Unmanned

(b) Penetration capability

1 Minimize interception

- a. Speed or altitude
- b. Deception
- c. Surprise
- d. Spoofing and jamming
- e. Diversion

- 1. Diversionary efforts
- 2. Attack simulation

f. Erection of false targets

2 Minimize time over defended territory

- a. Speed
- b. Use of fast parasite carriers or missiles

3 Defend against interception

- a. Guns
- b. Missiles
- c. Fire control
- d. Spoofing and jamming
- e. Erection of false targets and influences
- f. Evasive action
- g. Escort
- h. Passive

1. Camouflage
2. Armor

(c) Electronic reconnaissance capability

- 1 Data gathering
- 2 Data recording
- 3 Data processing and analysis (air)
- 4 Analysis (ground)

(d) Weather reconnaissance capability

- 1 Data gathering
- 2 Data recording
- 3 Data processing and analysis (air)
- 4 Analysis (ground)
- 5 Intercept (ground and air)

(e) Visual reconnaissance capability

- 1 Data gathering, assistance for
- 2 Recording

(f) Aerial photographic capability

- 1 Cameras and components
- 2 Mounts, stabilizers
- 3 Controls
- 4 Film
- 5 Airborne processing
- 6 Ground processing and/or receiving, recording
- 7 Analysis or interpretation
- 8 Reproduction
- 9 Illuminants

(g) Aeronautical charting capability

- 1 Data gathering
- 2 Geodetic control
- 3 Analysis and compilation (photogrammetric)
- 4 Reproduction

(h) Attack development capability

- 1 Obtaining and compiling
  - a. Navigation aids
  - b. Briefing aids
  - c. Identification aids
- 2 Reproduction

- (i) Cartography<sup>\*</sup>
  - 1 Data gathering
  - 2 Geodetic control
- (j) Transmission of reconnaissance data
  - 1 Ground-ground
  - 2 Ground-air
  - 3 Air-ground
- (k) Target location, identification, and marking
- (l) Illuminant launching or release (air)
- (m) Illuminant aiming and guidance
- (n) Control, communication, navigation
  - 1 Air to ground, ground to air communications
  - 2 Air to air communications
  - 3 Airborne identification, detection, warning
  - 4 Escort or defensive missile control
  - 5 Security and counter measures
  - 6 Navigation and rendezvous
  - 7 Landing and traffic control
  - 8 Security and counter measures
- (o) Assessment of results
  - 1 Data gathering
  - 2 Data analysis
- (p) Range, provisions for
  - 1 Towing or coupling
  - 2 Refueling
  - 3 Modification of basic aircraft
- (q) Mobility, provisions for
  - 1 Preparation of bases
  - 2 Mobility of essential equipment
  - 3 Transport force and equipment
- (r) Special support
  - 1 Intelligence
  - 2 Personnel

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<sup>\*</sup> Corps of Engineers responsible for analysis, compilation, and reproduction.  
U. S. Coast and Geodetic Survey responsible to U. S. Corps of Engineers for  
river, harbors, waterways (U. S.).

- 3 Support
- 4 Communications, control, and signalling
- 5 Weather service
- 6 Bases; utilities, facilities, defense
- 7 Logistic support
- 8 Emergency capabilities
- 9 Air crew support
- 10 General personnel support
- 11 Training

c. Escort forces

- (1) Mission.- To provide a mobile air defense for the bomber force.
- (2) Types of mission

- (a) Escort
- (b) Defense
- (c) Interdiction
- (d) Counter-air

(3) Requirements

- (a) Weapons carrier

- 1 Manned
- 2 Unmanned

- (b) Weapons
- (c) Weapons launching or release
- (d) Fire control or guidance
- (e) Countermeasures
- (f) Defensive capability

- 1 Camouflage
- 2 Armor
- 3 Spoofing and jamming
- 4 False targets and influences
- 5 Evasive action

- (g) Control, communications, and navigation

- 1 Navigation
- 2 Landing
- 3 Station keeping
- 4 Identification, warning, intercept control
- 5 Ground-air, air-ground, communications
- 6 Air-air communications
- 7 Security, counter measures

- (h) Weapon selection (see par 5a(9))
- (i) Assessment of results

- 1 Data gathering
- 2 Data analysis

(j) Range, provision for

- 1 Towing or coupling
- 2 Refueling

(k) Mobility, provisions for

- 1 Preparation of bases
- 2 Mobility of special equipment
- 3 Transport forces and equipment

(l) Special support

- 1 Intelligence
- 2 Personnel
- 3 Support for functional items
- 4 Weather service
- 5 Bases; facilities, utilities, defense
- 6 Logistic support
- 7 Emergency capabilities
- 8 Air crew support
- 9 General personnel support
- 10 Training

d. Specialized transport forces

- (1) Mission.- To provide mobility for strategic air forces.
- (2) Requirements.

(a) Carriers

(b) Cargo capability

- 1 Ground handling and loading
- 2 Aircraft loading
- 3 Cargo restraint
- 4 Jettisoning

(c) Personnel capability

- 1 Boarding and seating
- 2 Personnel services
- 3 Food
- 4 Emergency

(d) Control, communications, navigation

- 1 Air to ground, ground to air communications
- 2 Air to air communication
- 3 Airborne identification, detection, rendezvous

- 4 Security and counter measures
- 5 Navigation and rendezvous
- 6 Landing and traffic control
- (e) Assessment of results
- (f) Range, provisions for
  - 1 Refueling and refueling operations
  - 2 Modifications of basic aircraft
- (g) Mobility, provisions for
  - 1 Preparation of bases
  - 2 Mobility of essential equipment
- (h) Special support
  - 1 Intelligence
  - 2 Personnel
  - 3 Support for functional items
  - 4 Communications, control, and signalling
  - 5 Weather service
  - 6 Bases; utilities, facilities, defense
  - 7 Emergency capabilities
  - 8 Air crew support
  - 9 General personnel support
  - 10 Training

TACTICAL AIR COMMAND  
FUNCTIONAL IMPLICATIONS OF  
TACTICAL AIR WARFARE

1. DEFINITION

- a. Tactical Air Operations.- The application of all air power, under the command or operational control of a theater or area commander, against an enemy's military potential and capabilities in being, normally only within the theater area of responsibility. (Nevertheless, restricted only by limitation of equipment and capabilities of designated units, tactical air operations may encompass any task necessary in the furtherance of the theater mission.)

2. MISSION OF USAF TACTICAL AIR FORCES

- a. To conduct tactical air operations as defined above

3. RESPONSIBILITIES OF USAF TACTICAL AIR FORCES

- a. Capacity to perform
  - (1) Air superiority operations
  - (2) Interdiction
  - (3) Close support
  - (4) Air defense of combat areas
  - (5) Tactical reconnaissance
    - (a) Electronic
    - (b) Visual
    - (c) Aerial photographic
    - (d) Charting and cartography
    - (e) Weather
  - (6) Troop carrier operations

4. GENERAL SUPPORT REQUIRED

- a. Intelligence
  - (1) Air order of battle
  - (2) Maps and charts
  - (3) Enemy capabilities
  - (4) Experience and morale of enemy forces
  - (5) Enemy ground defense system
  - (6) Enemy target system data
  - (7) Weather data
  - (8) Enemy reaction to attack



**b. Personnel**

- (1) Air crew
- (2) Support

**c. Support for functional items**

- (1) Ground
- (2) Air

**d. Communications, control, and signalling**

**e. Navigation and flight control**

**f. Weather service**

**g. Bases, with all facilities and utilities for personnel and equipment, plus defensive capability**

**h. Logistic support**

- (1) Reporting of needs
- (2) Supply system
- (3) Transportation, air, sea, land
- (4) Handling and distribution

**i. Emergency capabilities**

- (1) Communication and location
- (2) Rescue system
- (3) Survival
- (4) Evasion and escape

**j. Air crew support**

- (1) Clothing
- (2) Food
- (3) Escape (air)
- (4) Protection
- (5) Services

**k. General personnel support**

- (1) Clothing
- (2) Food
- (3) Protection
- (4) Medical

**l. Training**

**m. Administration**

## 5. COMPONENT FORCES REQUIREMENTS

### a. Tactical bombardment forces

#### (1) Weapon carriers

- (a) Manned
- (b) Unmanned

#### (2) Penetration capability

##### (a) Minimize interception

- 1 Speed or altitude
- 2 Deception
- 3 Surprise
- 4 Spoofing and jamming
- 5 Diversion

- a Diversionary efforts
- b Attack simulation

##### 6 Erection of false targets and influences

##### (b) Minimize time over defended territory

- 1 Speed
- 2 Use of fast parasite carriers or missiles

##### (c) Defend against interception

- 1 Guns
- 2 Missiles
- 3 Fire control
- 4 Spoofing and jamming
- 5 Erection of false targets and influences
- 6 Evasive action
- 7 Escort
- 8 Passive

- a Camouflage
- b Armor

#### (3) Weapons, tactical

- (a) Nuclear
- (b) High explosive
- (c) Bacteriological
- (d) Chemical
- (e) Psychological
- (f) Missile projecting

- (4) Weapons launching or release
- (5) Weapons aiming and guidance
- (6) Target location, identification, marking
- (7) Tactical control, communication, navigation
  - (a) Ground-ground communications and control
  - (b) Air-ground, ground-air communications and control
  - (c) Identification, detection, warning
  - (d) Escort or defensive missile control
  - (e) Navigation and rendezvous
    - 1 Ground-base
    - 2 Airborne
  - (f) Landing and traffic control
  - (g) Security and countermeasures
  - (h) Station keeping
- (8) Weapon selection
  - (a) Target analysis
  - (b) Computation of weapon effectiveness
  - (c) Computation of operational conditions
    - 1 Carrier characteristics
    - 2 Attack methods
    - 3 Weather
    - 4 Base or launching site characteristics
- (9) Assessment of results
  - (a) Data gathering
  - (b) Data analysis
- (10) Mobility, provisions for
  - (a) Preparation of bases
  - (b) Mobility of essential equipment
  - (c) Transport force and equipment
  - (d) Air refueling, towing, or coupling
- (11) Special support
  - (a) Intelligence
  - (b) Personnel
  - (c) Support for functional items
  - (d) Weather service
  - (e) Bases; facilities, utilities, defense
  - (f) Logistic support
  - (g) Emergency capabilities

- (h) Air crew support
- (i) General personnel support
- (j) Training

b. Tactical air combat forces (defense and counter-air)

(1) Weapon carriers

- (a) Manned
- (b) Unmanned

(2) Penetration capability

(a) Minimize interception

- 1 Speed or altitude
- 2 Surprise
- 3 Deception
- 4 Spoofing and jamming
- 5 Diversion

- a Diversionary efforts
- b Attack simulation

6 Erection of false targets and influences

(b) Minimize time over defended territory

- 1 Speed
- 2 Use of fast parasite carriers or missiles

(c) Defend against interception

- 1 Guns
- 2 Missiles
- 3 Fire control
- 4 Spoofing and jamming
- 5 Erection of false targets and influences
- 6 Evasive action
- 7 Escort
- 8 Passive

- a Camouflage
- b Armor

(3) Weapons

- (a) Air-air
- (b) Air-ground

- (4) Weapons launching or release (air)
- (5) Weapon aiming or guidance

- (6) Ground target location, identification, and marking
- (7) Control, communication, navigation
  - (a) Air-to-ground, ground-to-air communication
  - (b) Ground-ground communications and control
  - (c) Air-air communications and control
  - (d) Identification, detection, warning (air and ground based)
  - (e) Intercept control (air and ground based)
  - (f) Navigation and rendezvous
    - 1 Ground-based
    - 2 Airborne
  - (g) Landing and traffic control
  - (h) Security and countermeasures
- (8) Weapon selection
  - (See par. 5.a.(8).)
- (9) Assessment of results
  - (a) Data gathering
  - (b) Data analysis
- (10) Mobility, provisions for
  - (a) Preparation of bases
  - (b) Mobility of essential equipment
  - (c) Transport force and equipment
  - (d) Air refueling, towing, or coupling
- (11) Special support
  - (a) Intelligence
  - (b) Personnel
  - (c) Support for functional items
  - (d) Weather service
  - (e) Bases; facilities, utilities, defense
  - (f) Logistic support
  - (g) Emergency capabilities
  - (h) Air crew support
  - (i) General personnel support
  - (j) Training

c. Tactical reconnaissance forces

- (1) Mission.- Collection and technical evaluation, interpretation, and dissemination of information about the enemy's terrain, hydrography, installations and concentrations.

(2) Requirements

(a) Carriers

- 1 Manned
- 2 Unmanned

(b) Penetration capability

1 Minimize interception

- a Speed or altitude
- b Deception
- c Surprise
- d Spoofing and jamming
- e Diversion

- (1) Diversionary attack
- (2) Attack simulation

f Erection of false targets and influence

2 Minimize time over defended territory

- a Speed
- b Parasite carriers or missiles
- c Data relay
- d Long-range collection equipment

3 Defend against interception

- a Guns
- b Missiles
- c Fire control
- d Spoofing and jamming
- e Erection of false targets and influences
- f Evasive action
- g Escort
- h Passive

- (1) Camouflage
- (2) Armor

(c) Electronic reconnaissance capability

- 1 Data gathering
- 2 Analysis (airborne)
- 3 Recording
- 4 Analysis, ground

(d) Weather reconnaissance capability

- 1 Data gathering
- 2 Data recording
- 3 Data processing and analysis (air)

(e) Visual reconnaissance capability

- 1 Data gathering, assistance for
- 2 Recording

(f) Aerial photographic capability

- 1 Cameras and components
- 2 Mounts, stabilizers
- 3 Controls
- 4 Film
- 5 Airborne processing
- 6 Ground processing and/or receiving, recording
- 7 Analysis or interpretation
- 8 Reproduction
- 9 Illuminants

(g) Illuminant launching or release

(h) Illuminant aiming or guidance

(i) Control, communication, navigation

- 1 Ground-ground communications and control
- 2 Air-ground, ground-air communications and control
- 3 Air-air communications and control
- 4 Identification, detection, warning
- 5 Navigation and rendezvous
- 6 Landing and traffic control
- 7 Security and countermeasures

(j) Weapons, electronic facility attack\*

- 1 Missile
- 2 Carrier-mounted
- 3 Detection, homing, and/or control

(k) Assessment of results

- 1 Data gathering
- 2 Data analysis

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\*May not be a definite and assigned function or tactical reconnaissance, but special equipment and training involved make it possible that equipment and function might be assigned to a tactical reconnaissance unit.

- (1) Mobility, provisions for
  - 1 Preparation of bases
  - 2 Mobility of essential equipment
  - 3 Transport force and equipment
  - 4 Refueling, coupling, towing
- (m) Charting and mapping capability
  - 1 Data gathering
  - 2 Geodetic control
  - 3 Analysis and compilation (photogrammetric)
  - 4 Reproduction
- (n) Attack development capability
  - 1 Obtaining and compiling
    - a Navigation aids
    - b Briefing aids
    - c Identification aids
  - 2 Reproduction
- (o) Transmission of reconnaissance data
  - 1 Ground-ground
  - 2 Ground-air
  - 3 Air-ground
- (p) Target location, identification, marking
- (q) Special support
  - 1 Intelligence
  - 2 Personnel
  - 3 Support for functional items
  - 4 Communications, control, signalling
  - 5 Weather service
  - 6 Bases; utilities, facilities, defense
  - 7 Logistic support
  - 8 Emergency capabilities
  - 9 Air crew support
  - 10 General personnel support
  - 11 Training

d. Tactical transport forces

- (1) Mission.- To provide air transportation for airborne and air transported forces, for employment within either friendly or enemy territory, and to resupply, sustain, and evacuate such forces or other friendly units until they are withdrawn or can be supplied and sustained by other means.



(2) Requirements

- (a) Carriers
- (b) Capability for airborne operations
  - 1 Personnel delivery, assault
  - 2 Cargo, vehicle, weapon delivery; assault
  - 3 Resupply
- (c) Cargo capability
  - 1 Ground handling and loading
  - 2 Aircraft loading
  - 3 Cargo restraint
  - 4 Jettisoning
- (d) Personnel capability
  - 1 Boarding and seating
  - 2 Personnel services
  - 3 Food
  - 4 Emergency
  - 5 Air evacuation (medical)
- (e) Penetration capability

(see par. 5.a.(2).)
- (f) Cargo aiming or guidance
- (g) Target (DZ) location, identification, marking
- (h) Control, communication, navigation
  - 1 Ground-ground communications and control
  - 2 Air-ground, ground-air communications and control
  - 3 Identification, detection, warning
  - 4 Escort or defensive missile control
  - 5 Navigation and rendezvous
  - 6 Landing or traffic control
  - 7 Security and countermeasures
  - 8 Station keeping
- (i) Assessment of results
  - 1 Data gathering
  - 2 Data analysis
- (j) Mobility, provisions for
  - 1 Preparation of bases
  - 2 Mobility of essential equipment
  - 3 Transport force and equipment
  - 4 Air refueling, towing, or coupling

(k) Special support

- 1 Intelligence
- 2 Personnel
- 3 Support for functional items
- 4 Weather service
- 5 Bases; facilities, utilities, defense
- 6 Logistic support
- 7 Emergency capabilities
- 8 Air crew support
- 9 General personnel support
- 10 Training

## AIR DEFENSE COMMAND

### FUNCTIONAL IMPLICATIONS OF AIR DEFENSE

#### 1. DEFINITIONS

- a. The primary aim of air defense is to prevent the offensive potential of the United States from being seriously reduced by air action.

#### 2. MISSION OF THE USAF AIR DEFENSE COMMAND

- a. To provide for and conduct the air defense of the United States

#### 3. RESPONSIBILITIES OF USAF DEFENSE FORCES

- a. Constant readiness
- b. Capacity to perform
  - (1) Active air defense
  - (2) Passive air defense

#### 4. GENERAL SUPPORT REQUIRED

- a. Intelligence
  - (1) Hostile air activity
  - (2) Maps and charts
  - (3) Enemy capabilities and equipment
  - (4) Experience and morale of enemy forces
  - (5) Enemy vulnerability
  - (6) Weather
- b. Personnel
  - (1) Air crew
  - (2) Support
- c. Support for functional items
  - (1) Air
  - (2) Ground
- d. Communications, control and signalling, general purpose
- e. Navigation and flight control, general purpose
- f. Weather service
- g. Bases, with all facilities for personnel and equipment, plus defensive capability.

**h. Logistic support**

- (1) Reporting of needs
- (2) Supply system
- (3) Transportation; air, sea, land
- (4) Handling and distribution

**i. Emergency capabilities**

- (1) Communication and location
- (2) Air/sea/land rescue system
- (3) Survival
- (4) Evasion and escape

**j. Air crew support**

- (1) Clothing and equipment
- (2) Food
- (3) Escape (air)
- (4) Protection
- (5) Services

**k. General personnel support**

- (1) Clothing
- (2) Services
- (3) Food
- (4) Protection and security
- (5) Medical

**l. Training**

**m. Administration**

**5. COMPONENT FORCES REQUIREMENTS**

**a. Air defensive forces**

**(1) Weapons carriers**

- (a) Manned
- (b) Unmanned

**(2) Interception capability**

- (a) Identification and traffic control
- (b) Detection, ranging, tracking

**1 Airborne**

- a Passive**
- b Active**

- 2 Ground
  - a Passive
  - b Active (including ground observers)
- (c) Control of carriers and controlling systems
  - 1 Ground
  - 2 Air
- (d) Command review and display of battle
  - 1 Computation
  - 2 Coordination
  - 3 Display
- (e) Weapons, air defense
  - 1 Guns
  - 2 Missiles
  - 3 Fire control
- (f) Weapons launching and release
  - 1 Ground
  - 2 Air
- (g) Weapon aiming and guidance
  - 1 Ground
  - 2 Air
- (3) Communications and navigation
  - (a) Communications
    - 1 Ground-ground
    - 2 Ground-air
    - 3 Air-ground
    - 4 Air-air
  - (b) Raid warning
  - (c) Security and counter-countermeasures
  - (d) Navigation
  - (e) Landing and traffic control
- (4) Electronic countermeasures
- (5) Weapon selection
  - (a) Enemy evaluation
  - (b) Weapon effectiveness

(c) Operational conditions

- 1 Enemy attack capabilities
- 2 Attack methods
- 2 Weather

(6) Assessment of results

- (a) Data gathering
- (b) Data analysis

(7) Mobility, provision for

- (a) Preparation of bases
- (b) Mobility of essential equipment
- (c) Transport force and equipment

(8) Special support

- (a) Intelligence
- (b) Personnel
- (c) Support for functional items
- (d) Weather service
- (e) Bases; facilities, utilities, security
- (f) Logistic support
- (g) Emergency capabilities
- (h) Air crew support
- (i) General personnel support
- (j) Training
- (k) Administration

b. Ground defensive forces

(1) Active

- (a) Guns
- (b) Control and communications\*
  - 1 Ground communications
  - 2 Identification and location
  - 2 Fire control
  - 4 Security and countermeasures

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\*Coordinative or planning functions for USAF, since this area is responsibility of Department of the Army.

- (c) Weapon launching\*
  - (d) Weapon aiming or guidance\*
  - (e) Weapon selection\*
    - 1 Target analysis
    - 2 Weapon effectiveness
    - 3 Operational conditions
  - (f) Assessment of results\*
    - 1 Data gathering
    - 2 Data analysis
  - (g) Mobility, provisions for\*
    - 1 Selection and preparation sites
    - 2 Mobility of essential equipment
    - 3 Transport force and equipment
- (2) Passive
- (a) Concealment
    - 1 Smoke
    - 2 Camouflage
    - 3 Cover
  - (b) Deception
    - 1 Decoys and dummies
    - 2 False targets and concentrations
  - (c) Raid warning
  - (d) Protection
    - 1 Equipment
    - 2 Personnel
  - (e) Medical facilities and supplies
  - (f) Ordnance disposal
  - (g) Contamination detection and decontamination
    - 1 Equipment
    - 2 Personnel
    - 3 Essential facilities and service

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\*Coordinative or planning functions for USAF, since this area is responsibility of Department of the Army.

- (h) Fire, protection and fighting
- (i) Emergency control and communications
- (j) Obstacles

(3) Special support\*

- (a) Intelligence
- (b) Personnel
- (c) Support for functional items
- (d) Bases or sites; facilities, utilities, security
- (e) Logistic support
- (f) General personnel support
- (g) Training
- (h) Administration

6. PASSIVE DEFENSE CONSIDERATION

a. Measures to coordinate with civil defense

- (1) Training
- (2) Warning
- (3) Shelters
- (4) Evacuation
- (5) Camouflage
- (6) Medical and first aid
- (7) Communication
- (8) Neutralization of unexploded bombs
- (9) Fire prevention and protections
- (10) Control centers
- (11) Ground observer corps

b. Assistance to community in

- (1) Evacuation
- (2) Dispersion
- (3) Shelters
- (4) Camouflage
- (5) Blackouts
- (6) Warning systems
- (7) Communications
- (8) Bomb reconnaissance and bomb disposal
- (9) Medical services
- (10) Decontamination services
- (11) Resources and rehabilitation services
- (12) Radiological countermeasures
- (13) Biological warfare detections and countermeasures

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\*Coordinative or planning functions for USAF, since this area is responsibility of Department of the Army.



## CONTINENTAL AIR COMMAND

### FUNCTIONAL IMPLICATIONS OF THE CONTINENTAL AIR COMMAND

1. **DEFINITION.**- The Continental Air Command administers the reserve forces of the USAF.
2. **MISSION.**- The mission of the Continental Air Command is administration of the USAF reserve forces as directed by the Chief of Staff, USAF.
3. **RESPONSIBILITIES.**- The Continental Air Command is responsible to the Chief of Staff, USAF, for administration of USAF reserve forces in regard to:
  - a. Flight training
  - b. Ground operation training
4. **GENERAL SUPPORT REQUIRED**
  - a. Intelligence
    - (1) Maps and charts
    - (2) Weather
  - b. Personnel
    - (1) Air crew
    - (2) Support
  - c. Support for functional items
    - (1) Ground
    - (2) Air
  - d. Communications, control and signalling; general purpose
  - e. Navigation and flight control; general purpose
  - f. Weather service
  - g. Bases with all facilities and utilities for personnel and equipment plus defensive capability
  - h. Logistic support
    - (1) Reporting of needs
    - (2) Supply system
    - (3) Transportation; air, sea, land
    - (4) Handling, storage and distribution
  - i. Emergency capabilities
    - (1) Communication and location
    - (2) Rescue system
    - (3) Survival
    - (4) Evasion and escape

j. Air crew support

- (1) Clothing
- (2) Food
- (3) Escape (air)
- (4) Protection
- (5) Services

k. General personnel support

- (1) Clothing
- (2) Services
- (3) Food
- (4) Protection
- (5) Medical

l. Training

5. COMPONENT FORCE REQUIREMENTS

a. Flight training forces

(1) Aircraft

- (a) Manned
- (b) Unmanned

(2) Capability to train

- (a) Learning capacity
- (b) Instruction
- (c) Familiarization
- (d) Testing
- (e) Evaluation
- (f) Selection

(3) Ground training equipment

- (a) Simulation
- (b) Representation
- (c) Graphic portrayal
- (d) Duplication

(4) Air training equipment

- (a) Duplication
- (b) Modified capacity
- (c) Simulation

(5) Control (ground)

- (a) Planning and programming
- (b) Administration
- (c) Coordination

- (6) Control communication, navigation
  - (a) Air to ground, ground to air communications
  - (b) Air to air communication
  - (c) Airborne identification, detection, warning
  - (d) Airborne inter-communications
  - (e) Ground to ground communications
  - (f) Security and counter measures
  - (g) Navigation
  - (h) Landing and traffic control
- (7) Assessment of training
  - (a) Performance data
    - 1 End results
    - 2 Excellence of operation
    - 3 Personality
  - (b) Performance data analysis
    - 1 Fixed standard
    - 2 Comparison
- (8) Mobility; provisions for
  - (a) Preparation of base and mobile equipment
  - (b) Mobility of essential equipment
  - (c) Transportation force and equipment
- (9) Special support
  - (a) Intelligence
  - (b) Personnel
  - (c) Support for functional items
  - (d) Weather service
  - (e) Bases, facilities, utilities, defense
  - (f) Logistic support
  - (g) Emergency capabilities
  - (h) Air crew support
  - (i) General personnel support
  - (j) Training
- b. Ground operation training forces
  - (1) Functional ground operational equipment
    - (a) Aircraft support (category A-1 and A-2 support)
    - (b) Ground equipment support (category B-1 and B-2)
  - (2) Capability to train (same as 5a(2))
  - (3) Ground training equipment (same as 5a(3))

- (4) Control (ground) (same as 5a(5))
- (5) Assessment of training (same as 5a(7))
- (6) Mobility, provisions for (same as 5a(8))
- (7) Special support (same as 5a(9))

## AIR MATERIEL COMMAND

### FUNCTIONAL IMPLICATIONS OF THE AIR MATERIEL COMMAND

#### 1. MISSION

- a. To provide system of procurement, production, maintenance and supply
- b. To provide overall logistical support
- c. To train specialized units

#### 2. RESPONSIBILITIES

- a. Processing
- b. Maintaining
  - (1) Air vehicles
  - (2) Ground vehicles
  - (3) Water vehicles
  - (4) Support equipment
  - (5) Personal equipment
- c. Storing
- d. Issuing
- e. Installing
- f. Training

#### 3. GENERAL SUPPORT REQUIRED

- a. Intelligence
- b. Personnel
  - (1) Military
  - (2) Civilian
- c. Support for functional items
  - (1) Ground
  - (2) Air
  - (3) Installed facilities
- d. Communications control
  - (1) Internal
  - (2) External
- e. Bases
- f. Logistic support
  - (1) Reporting of needs
  - (2) Supply system

(3) Transportation

- (a) Air
- (b) Land
- (c) Water

(4) Handling and distribution

g. Emergency capabilities

h. General personnel support

- (1) Clothing and equipment
- (2) Services
- (3) Food
- (4) Protection
- (5) Medical

i. Training

j. Administration

4. COMPONENT ORGANIZATION REQUIREMENTS

a. Procurement

- (1) Office maintenance
- (2) Calculation and recording
- (3) Reproduction
- (4) Distribution

b. Production program supervision

- (1) Office maintenance
- (2) Equipment or materiel testing
- (3) Inspecting or measuring
- (4) Materials handling
- (5) Photographing or recording

c. Depot maintenance

- (1) Materials handling and storing
- (2) Testing
- (3) Repairing
- (4) Re-manufacturing (small parts)
- (5) Servicing, lubricating

d. Supply

- (1) Gathering data
- (2) Analyzing statistics
- (3) Establishing requirements
- (4) Planning logistics
- (5) Cataloging

**e. Storage**

- (1) Handling
- (2) Preserving, lubricating, crating
- (3) Sheltering
- (4) Servicing
- (5) Testing

**f. Publishing**

- (1) Gathering data
- (2) Editing and writing
- (3) Reproducing
- (4) Storing
- (5) Distributing

**g. Industrial planning**

- (1) Gathering data
- (2) Analyzing statistics
- (3) Reproducing
- (4) Disseminating

**h. Installing facilities**

- (1) Engineering
- (2) Constructing
- (3) Transporting

**i. Training (special troops)**

- (1) Subsistence and personal support
- (2) Shelter
- (3) Transportation
- (4) Training aids

**5. ASSESSMENT OF RESULTS**

- a. Data gathering
- b. Data analysis

**6. MOBILITY, PROVISIONS FOR**

- a. Mobility of essential equipment
- b. Transport force and equipment

**7. SPECIAL SUPPORT**

- a. Intelligence
  - (1) Receiving reports

b. Personnel

- (1) Special types
- (2) General duty

c. Support for functional items

- (1) Fixed
- (2) Mobile

d. Weather

e. Bases, facilities, utilities

f. Emergency capabilities

g. General personnel support

h. Training



FUNCTIONAL IMPLICATIONS OF  
THE AIR RESEARCH AND DEVELOPMENT COMMAND

1. DEFINITIONS: The Air Research and Development Command is the USAF command obligated to maintain and improve the functional quality of USAF Weapon Systems and other material.

2. MISSION: The mission of the Air Research and Development Command is to attain and maintain qualitative superiority of USAF material from the initial formulation of a development plan (AFR 80-30) to the phase-out of the resulting article from inventory.

3. RESPONSIBILITY: The responsibility of the Air Research and Development Command is the administration of all assigned research and development facilities so that the command mission is accomplished.

4. GENERAL SUPPORT REQUIRED

a. Intelligence

- (1) Maps and charts
- (2) Enemy capabilities and equipment
- (3) Experience and morale of enemy forces
- (4) Enemy defense system
- (5) Weather data
- (6) Enemy reaction to attack
- (7) Enemy production capabilities

b. Personnel

- (1) Air crew
- (2) Support

c. Support for functional items

- (1) Ground
- (2) Air

d. Communications control and signalling, general purpose.

e. Navigation and flight control, general purpose.

f. Weather service

g. Bases with all facilities and utilities for personnel and equipment plus defensive capability.

h. Logistic support

- (1) Reporting of needs
- (2) Supply system
- (3) Transportation; air, sea, land
- (4) Handling, storage and distribution

**i. Emergency capabilities**

- (1) Communication and location
- (2) Rescue system
- (3) Survival
- (4) Evasion and escape

**j. Air crew support**

- (1) Clothing
- (2) Food
- (3) Escape (air)
- (4) Protection
- (5) Services

**k. General personnel support**

- (1) Clothing
- (2) Services
- (3) Food
- (4) Protection
- (5) Medical

**l. Training**

- (1) Military personnel
- (2) Civilian personnel
- (3) Operational
- (4) Maintenance

**m. Civilian personnel**

- (1) Recruitment
- (2) Administration
- (3) Services
- (4) Training

**n. Research and development projects and tests**

- (1) Planning
- (2) Administering
- (3) State of the art
- (4) Integration in command operation
- (5) Assignment of center responsibility
- (6) Integration in operation of interested center
- (7) Financing
- (8) Manning
- (9) Equipping, supporting and instrumenting
- (10) Scheduling
- (11) Performing
- (12) Data acquisition

o. Publication

- (1) Publications of ARDC Headquarters (ARDCR 5-5)
  - (a) Administrative (ARDCR 5-5)
  - (b) Manual (ARDCR 5-5)
  - (c) Specification (AFR 81-1)
  - (d) Research and Development Reports (ARDCR 5-6)
  - (e) Progress and status reports (AFR 80-27)
- (2) Publication of ARDC centers (ARDCR 5-5)
  - (a) Administrative (ARDCR 5-5)
  - (b) Specification (ARDCR 22-3, par 4f and 4g)
  - (c) Research and Development Reports (ARDCR 5-6)
  - (d) Progress and status reports (AFR 80-27)

p. Test reporting

- (1) Data processing
  - (a) Computing methods and mechanisms
- (2) Data analysis
- (3) Data evaluation
- (4) Promptness of report
- (5) Scope of report
- (6) Regular report preparation
- (7) Regular report distribution
- (8) Special reports
- (9) Communication relative to tests

q. Coordination

- (1) USAF commands
- (2) Other military activities
- (3) Inter-center

5. COMPONENT MISSION REQUIREMENTS

a. Research (AFR 80-27a)

- (1) Basic research (AFR 80-27a)
- (2) Applied research (AFR 80-27a)
- (3) General operational requirements (AFR 80-30)
- (4) Technical program plan (AFR 80-30)
- (5) Technical program directive (AFR 80-30)
- (6) ARDC facilities
- (7) Contractor facilities
- (8) Special projects - same type of organization, as applicable as 4n.
  - (a) Primary research project

- (b) Research projects in conjunction with primary development projects
- (9) Facilities; equipment and instruments
  - (a) Facilities support
  - (b) Standard facilities, as applicable
    - 1 Airborne
    - 2 Ground
  - (c) Special facilities, as applicable
    - 1 Airborne
    - 2 Ground
- (10) Mobility of ground research and support facilities
  - (a) Preparation of bases
  - (b) Mobility of essential equipment
  - (c) Operability under varied environmental conditions
  - (d) Transport force and equipment
- (11) Vulnerability of ground research and support facilities
  - (a) Natural causes; floods, tornadoes
  - (b) Sabotage
  - (c) Enemy action
  - (d) Protective methods and mechanisms
- (12) Special support
  - (a) Intelligence
  - (b) Personnel
  - (c) Support for functional items
  - (d) Weather service
  - (e) Bases, facilities, utilities, defense
  - (f) Logistic support
  - (g) Emergency capabilities
  - (h) Air crew support
  - (i) General personnel support
  - (j) Training
  - (k) Planning, supporting, performing and recording special tests
  - (l) Documents

b. Development (AFR 80-13)

- (1) General operational requirements (AFR 80-30)
- (2) Development plan for a system (AFR 80-30)
- (3) Development directive (AFR 80-30)
- (4) Weapon System (AFR 80-30)
- (5) Supporting system (AFR 80-30)

- (6) Strategic Air Development (AFR 80-27)
- (7) Air Defense Development (AFR 80-27)
- (8) Tactical Air Development (AFR 80-27)
- (9) Air Transport Development (AFR 80-27)
- (10) Supporting Service Development (AFR 80-27)
- (11) Common Components Development (AFR 80-27)
- (12) ARDC facilities
- (13) Contractor facilities
- (14) Special projects - same type of organization, as applicable as 4n.
- (15) Facilities; equipment and instruments - same type as 5a(9).
- (16) Mobility of ground research and support facilities - same type as 5a(10).
- (17) Vulnerability of ground research and support facilities - same type as 5a(11).
- (18) Special support - same type as 5a(12).

c. Armed Services Technical Information Agency (ASTIA)

- (1) Administration
- (2) Facilities
- (3) Documents serviced
- (4) Operational procedures
- (5) Future potentialities

d. Air Force historical properties

- (1) Administration
- (2) Facilities
- (3) Historical articles displayed
- (4) Operational procedures
- (5) Future potentialities

## AIR TRAINING COMMAND

### FUNCTIONAL IMPLICATIONS OF THE AIR TRAINING COMMAND

1. DEFINITION.- The Air Training Command provides appropriate flight, crew or technical training to USAF personnel.
2. MISSION.- The mission of the Air Training Command is the conduct of training operations.
3. RESPONSIBILITIES.- Supervise, operate or monitor training personnel, programs and facilities for the following basic training types:
  - a. Flight
  - b. Ground operations
4. GENERAL SUPPORT REQUIRED (Similar to strategic air)
  - a. Intelligence
  - b. Personnel
    - (1) Air crew
    - (2) Support
  - c. Support for functional items
    - (1) Ground
    - (2) Air
  - d. Communications, control and signalling, general purpose
  - e. Navigation and flight control, general purpose
  - f. Weather service
  - g. Bases, with all facilities and utilities for personnel and equipment plus defensive capability
  - h. Logistic support
    - (1) Reporting of needs
    - (2) Supply system
    - (3) Transportation; air, sea, land
    - (4) Handling, storage and distribution
  - i. Emergency capabilities
    - (1) Communication
    - (2) Rescue system
    - (3) Survival
    - (4) Evasion and escape
  - j. Air crew support
    - (1) Clothing
    - (2) Food

- (3) Escape (air)
- (4) Protection
- (5) Services

k. General personnel support

- (1) Clothing
- (2) Services
- (3) Food
- (4) Protection
- (5) Medical

l. Training

5. COMPONENT FORCES REQUIREMENTS

a. Flight training forces

- (1) Aircraft
  - (a) Manned
  - (b) Unmanned
- (2) Capability to train
  - (a) Learning capacity
  - (b) Instruction
  - (c) Familiarization
  - (d) Testing
- (3) Ground training equipment
  - (a) Simulation
  - (b) Representation
  - (c) Graphic portrayal
  - (d) Duplication
- (4) Air training equipment
  - (a) Duplication
  - (b) Modified capacity
  - (c) Simulation
- (5) Control (ground)
  - (a) Planning and programming
  - (b) Administration
  - (c) Coordination
- (6) Control, communication, navigation
  - (a) Air to ground, ground to air communications
  - (b) Air to air communications

- (c) Airborne identification, detection, warning
- (d) Airborne inter-communications
- (e) Ground to ground communications
- (f) Security and counter measures
- (g) Navigation
- (h) Landing and traffic control

(7) Assessment of training

(a) Performance data

- 1 End results
- 2 Excellence of operation
- 3 Personality

(b) Performance data analysis

- 1 Fixed standard
- 2 Comparison

(8) Mobility, provisions for

- (a) Preparation of bases and mobile equipment
- (b) Mobility of essential equipment
- (c) Transportation force and equipment

(9) Special support

- (a) Intelligence
- (b) Personnel
- (c) Support for functional items
- (d) Weather service
- (e) Bases facilities, utilities, defense
- (f) Logistic support
- (g) Emergency capabilities
- (h) Air crew support
- (i) General personnel support
- (j) Training

b. Ground operation forces

(1) Functional ground operational equipment

- (a) Aircraft support (category A-1 and A-2 support)
- (b) Ground equipment support (category B-1 and B-2 support)

- (2) Capability to train (same as 5a(2))
- (3) Ground training equipment (same as 5a(3))
- (4) Control; ground (same as 5a(5))
- (5) Assessment of training (same as 5a(7))
- (6) Mobility, provisions for (same as 5a(8))
- (7) Special support (same as 5a(9))



## AIR PROVING GROUND COMMAND

### FUNCTIONAL IMPLICATIONS OF THE AIR PROVING GROUND COMMAND

1. **DEFINITIONS:** The Air Proving Ground Command is the USAF command obligated to perform operational suitability tests on USAF aircraft, material and equipment.
2. **MISSION:** The mission of the Air Proving Ground Command is to determine the operational suitability of aircraft, material and equipment used or proposed for use by the air force, specifically category A-1 and B-1 items; to recommend classification of category A-1 items and to classify category B-1 items.
3. **RESPONSIBILITY:** The Air Proving Ground Command will determine the operational suitability of aircraft, material and equipment used or proposed for use by the USAF and coordinate with Air Research and Development Command, Air Materiel Command, Special Weapons Command and other major Air Commands to insure maximum effective use of USAF material, equipment, personnel facilities and services.
4. **GENERAL SUPPORT REQUIRED:**
  - a. **Intelligence**
    - (1) Maps and charts
    - (2) Enemy capabilities and equipment
    - (3) Experience and morale of enemy forces
    - (4) Enemy defense system
    - (5) Weather data
    - (6) Enemy reaction to attack
  - b. **Personnel**
    - (1) Air crew
    - (2) Support
  - c. **Support for functional items**
    - (1) Ground
    - (2) Air
  - d. **Communications, control and signalling; general purpose.**
  - e. **Navigation and flight control; general purpose.**
  - f. **Weather service**
  - g. **Bases with all facilities and utilities for personnel and equipment plus defensive capability**
  - h. **Logistic support**
    - (1) Reporting of needs
    - (2) Supply system
    - (3) Transportation; air, sea, land
    - (4) Handling, storage and distribution

**i. Emergency capabilities**

- (1) Communication and location
- (2) Rescue system
- (3) Survival
- (4) Evasion and escape

**j. Air crew support**

- (1) Clothing
- (2) Food
- (3) Escape (air)
- (4) Protection
- (5) Services

**k. General personnel support**

- (1) Clothing
- (2) Services
- (3) Food
- (4) Protection
- (5) Medical

**l. Training**

- (1) Operational
- (2) Maintenance

**m. Test**

- (1) Planning
- (2) Manning
- (3) Equipping, supporting and instrumenting
- (4) Scheduling
- (5) Performing
- (6) Data acquisition

**n. Test reporting**

- (1) Data processing
  - (a) Computing methods and mechanisms
  - (b) Data analysis
  - (c) Data evaluation
  - (d) Promptness of report
  - (e) Scope of report
  - (f) Regular report preparation
  - (g) Regular report distribution
  - (h) Special reports
  - (i) Communication relative to tests

**o. Coordination**

- (1) USAF commands
- (2) Other military activities

p. Classification (see AFR 80-6, par 3)

(1) Consideration of classes

- (a) Development type
- (b) Adopted type

- 1 Tentative standard
- 2 Standard
- 3 Substitute standard
- 4 Limited standard

- (2) Recommendation of classification for category A-1 items
- (3) Classification of category B-1 items

5. COMPONENT FORCE REQUIREMENTS:

a. Flight tests

(1) Aircraft

- (a) Manned
- (b) Unmanned

- (2) Tests of unproven aircraft and unproven equipment
- (3) Tests of unproven aircraft and proven equipment
- (4) Tests of proven aircraft and unproven equipment
- (5) Flight of support aircraft as directed to flight of test aircraft
- (6) Special test support equipment located on the ground

- (a) Mobility
- (b) Operability under varied environmental conditions

(7) Operational performance capability.- Test aircraft in flight.

- (a) Actual performance
- (b) Comparative performance

(8) Operational performance capability.- Test aircraft on ground.

- (a) Actual performance
- (b) Comparative performance

(9) Test facilities, airborne

- (a) Specially trained personnel
- (b) Special instruments and equipment
- (c) Standard trained personnel
- (d) Standard instruments and equipment

(10) Test facilities, ground

- (a) Specially trained personnel
- (b) Special instruments and equipment
- (c) Standard trained personnel
- (d) Standard instruments and equipment

(11) Mobility of ground test and support equipment

- (a) Preparation of bases
- (b) Mobility of essential equipment
- (c) Operability under varied environmental conditions
- (d) Transport force and equipment

(12) Special support

- (a) Intelligence
- (b) Personnel
- (c) Support for functional items
- (d) Weather service
- (e) Bases, facilities, utilities, defense
- (f) Logistic support
- (g) Emergency capabilities
- (h) Air crew support
- (i) General personnel support
- (j) Training
- (k) Planning, supporting, performing and recording special tests

b. Ground tests

- (1) Category A-1 equipment (refer AFR 80-6)
- (2) Category B-1 equipment (refer AFR 80-6)
- (3) Special ground test support equipment
- (4) Support aircraft for test of ground equipment
  - (a) Manned
  - (b) Unmanned
- (5) Operational performance capability
  - (a) Actual performance
  - (b) Comparative performance
- (6) Test facilities, ground (same as 5a(10))
- (7) Mobility of ground test and support equipment (same as 5a(11))
- (8) Special support (same as 5a(12))

## MILITARY AIR TRANSPORT SERVICE

### FUNCTIONAL IMPLICATIONS OF THE MILITARY AIR TRANSPORT SERVICE

1. MISSION OF THE MILITARY AIR TRANSPORT SERVICES: The mission of the Military Air Transport Service is to provide:

- a. Air transport in support of the Department of Defense.
- b. Support and technical services such as world-wide communications, weather, air rescue, photographic and charting services, and flight service centers within the continental United States to support Air Force Commands and other military, governmental, and civil agencies, both foreign and domestic, as directed by the Chief of Staff, USAF.

2. RESPONSIBILITIES OF THE MILITARY AIR TRANSPORT SERVICE

- a. Operation of a global air transport system
- b. Airlift of Department of Defense patients on overseas routes
- c. Special air missions
- d. Aircraft ferrying service
- e. Training of transport crews for MATS and other commands
- f. Utilization of air transport
- g. Liaison with civil air carriers
- h. Contracting and purchasing of MATS materials
- i. Organization, operation and command jurisdiction for:
  - (1) Air Weather Service
  - (2) Airways and Air Communications Service
  - (3) Air Rescue Service
  - (4) Flight Service
  - (5) Air Photographic and Charting Service
  - (6) Air Resupply and Communications Service
- j. Establishment, control, operation and maintenance of air route facilities, world-wide
- k. Flight control
- l. Ports of aerial embarkation for MATS
- m. Air transportation priorities
- n. Preventive and progressive maintenance
- o. Utilization of civil air carriers by the Department of Defense
- p. Advisory to Department of Defense of air transport matters
- q. National emergency plans for air transport matters
- r. Coordination with US Navy and Chief of Staff, USAF and Chief of Naval Operations, USN on joint participation of services

3. GENERAL SUPPORT REQUIRED

- a. Intelligence

- b. Personnel
  - (1) Air crew
  - (2) Support
- c. Support of functional items
- d. Communications
- e. Navigation
- f. Bases, with facilities and utilities for personnel and equipment plus defensive capabilities
- g. Logistic support
  - (1) Reporting needs
  - (2) Supply system
  - (3) Transportation (land, sea, air)
  - (4) Handling, storage and distribution
- h. Emergency capabilities
  - (1) Communications and location
  - (2) Rescue system
  - (3) Survival
  - (4) Escape and evasion
- i. Personnel support, general
  - (1) Clothing
  - (2) Food
  - (3) Services
  - (4) Protection
  - (5) Medical
  - (6) Recreational
- j. Air crew support
  - (1) Clothing
  - (2) Food
  - (3) Escape
  - (4) Rescue
  - (5) Protection
- k. Administration
  - l. Training
    - (1) Air crew
    - (2) Maintenance
    - (3) Traffic
- m. Inspection, technical
- n. Maintenance

#### 4. COMPONENT SERVICES REQUIREMENTS

##### a. Aircraft

- (1) Passenger
- (2) VIP
- (3) Cargo
- (4) Air evacuation

##### b. Cargo capabilities

- (1) Determining requirements
- (2) Flight scheduling
- (3) Space allocation
- (4) Priorities
- (5) Traffic
- (6) Special mission
- (7) Handling
  - (a) Loading
  - (b) Unloading
  - (c) Security (tie-down)
  - (d) Ground handling and en-route storage
- (8) Security

##### c. Passenger capabilities

- (1) Determining requirements
- (2) Flight scheduling
- (3) Space allocations
- (4) Priorities
- (5) Traffic
- (6) Special mission (VIP etc.)
- (7) Air evacuation
  - (a) Litters and associated equipment
  - (b) Medical supplies
  - (c) Sanitation
  - (d) Medical attendants
  - (e) Special food considerations
  - (f) Special survival considerations
  - (g) Oxygen
- (8) Passenger handling
  - (a) Ticketing
  - (b) Notification
  - (c) Transportation
  - (d) Luggage handling
  - (e) In-flight feeding

- (f) Sanitation
- (g) Oxygen
- (h) Other comfort considerations

**\*d. Additional services**

- \* (1) Air Weather Service
- \* (2) Airways and Air Communications Service
- \* (3) Air Rescue Service
- \* (4) Flight Service
- \* (5) Air Photographic and Charting Service
- (6) Air Resupply and Communications Service

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**\*NOTE: Functional implications of above mentioned services covered in separate outlines in this series.**



## FUNCTIONAL IMPLICATIONS OF THE AIR WEATHER SERVICE

1. MISSION OF THE AIR WEATHER SERVICES: The Air Weather Service will provide specialized meteorological service required to support the Departments of the Air Force and the Army on a world wide basis. This service will include meteorological observations, forecasts, and climatological studies.

### 2. RESPONSIBILITIES OF THE AIR WEATHER SERVICE

- a. Ground meteorological units
- b. Aerial reconnaissance units
- c. Subordinate weather units
- d. Plans and programs for future needs
- e. Assists the Air National Guard with meteorological service
- f. Coordinates with other U.S. agencies concerned
- g. Provides for a reserve force of weather personnel
- h. Furnishes Air Weather Service personnel for committees
- i. Controls assignment of AWS personnel in ZI and overseas
- j. Maintenance of equipment

### 3. GENERAL SUPPORT REQUIRED

- a. Intelligence
  - (1) Weather
  - (2) General
  - (3) Maps and charts
- b. Personnel
  - (1) Weather
  - (2) Air crew
  - (3) Support
- c. Support of functional items
- d. Communications and signalling
  - (1) Teletype
  - (2) Facsimile
  - (3) Radio
  - (4) Other
- e. Navigation
- f. Bases, with facilities and utilities for personnel and equipment plus defensive capabilities
- g. Logistic support
  - (1) Reporting of needs
  - (2) Supply system
  - (3) Transportation (land, sea, air-including air-drop)
  - (4) Handling, storage and distribution

**h. Emergency capabilities**

- (1) Communications and location
- (2) Rescue system
- (3) Survival
- (4) Escape and evasion

**i. Personnel support; general**

- (1) Clothing
- (2) Food
- (3) Services
- (4) Protection
- (5) Medical
- (6) Recreational

**j. Air crew support (reconnaissance)**

- (1) Clothing
- (2) Food
- (3) Escape
- (4) Rescue
- (5) Protection
- (6) Services

**4. COMPONENT SERVICES REQUIRED**

**a. Observation (ground)**

- (1) Data gathering
- (2) Data recording
- (3) Data processing and analysis
- (4) Communication (ground to ground)
- (5) Dissemination

**b. Observation (Air Weather Reconnaissance)**

- (1) Data gathering
- (2) Data recording
- (3) Data processing and analysis
- (4) Communications to ground
- (5) Dissemination to using activities

**c. Forecasting**

- (1) Terminal
- (2) Route
- (3) Flight
- (4) Area
- (5) Specialized

d. Dissemination and display

- (1) Graphic
- (2) Teletype sequences
- (3) Facsimile reproductions
- (4) Other

e. Research and development

- (1) Atmospheric
- (2) Climatological
- (3) Special projects

f. Training

- (1) Observation
- (2) Forecasting
- (3) Electronic equipment specialists
- (4) Reconnaissance
  - (a) Air crew
  - (b) Airborne weather specialists

g. Carriers (Airborne Weather)

h. Administration

i. Coordination with

- (1) US Weather Bureau
- (2) US Army
- (3) US Navy Aerological Service
- (4) US Coast Guard
- (5) US Merchant Marine
- (6) Foreign Surface Vessels
- (7) Foreign Weather Services
- (8) Scientific expeditions

**FUNCTIONAL IMPLICATIONS OF**  
**AIRWAYS AND AIR COMMUNICATIONS SERVICE**

**1. DEFINITIONS**

- a. Airways communications and ground electronic aids to air operations.- Utilizing mobile, air transportable, or fixed plant equipment, include but not necessarily limited to:
- (1) Airdrome control towers.
  - (2) Point-to-point and ground-to-air communications stations.
  - (3) Radio ranges, homing beacons, fan marker beacons, direction finders, instrument approach and landing systems, radar beacons, ground control approach systems, long range navigation systems, and other aids to air navigation.
  - (4) Landline teletype and interphone systems and stations.
  - (5) Communications stations for intercepting, collecting and disseminating meteorological information and data.
  - (6) Communications facilities for the processing, relay and delivery of message traffic.
  - (7) Cryptographic facilities for the encryption and decryption of message traffic.
- b. Military air traffic service.- A system to provide for the safe and expeditious movement of military air traffic. This service includes the control of air traffic within airdrome control zones and approach control zones and the operation of designated air traffic control centers.
- c. Air Force global communications system.- A system to provide long distance point-to-point and ground-air communications common to the operations of many Air Force commands.
- d. Special services or special projects.- Communications facilities or systems authorized for any specific purpose of the Chief of Staff, USAF.

2. MISSION OF USAF AIRWAYS AND AIR COMMUNICATION SERVICE: To provide the services defined in paragraph 1 (above) to all Air Force activities requiring them and to other agencies in accordance with policies established by the Chief of Staff, USAF.

**3. RESPONSIBILITIES OF THE AIRWAYS AND AIR COMMUNICATIONS SERVICE**

- a. Operation of facilities.
- b. Activating, training and equipping mobile units.
- c. Installation and removal of facilities.
- d. Organizational and field maintenance.
- e. Flight checking AACS operated electronic equipment.
- f. Providing technical assistance on requirements.
- g. Providing Chief of Staff, USAF, communications-electronics technical assistance for programming future needs.

- h. Provide organization, personnel and facilities and budget estimates.
- i. Make recommendations for augmentation, establishment, relocation, reduction or discontinuance of facilities.
- j. Obtain approval prior to discontinuance of facilities.
- k. Establishment of uniform operating practices.
- l. Preparing military characteristics and initiating action leading to the development by appropriate research and development agencies of AACCS equipment.
- m. Special projects and services as directed by the Chief of Staff, USAF.

#### 4. GENERAL SUPPORT REQUIRED

##### a. Personnel

###### (1) Communications

- (a) Communications specialists
- (b) Maintenance specialists
- (c) Support

###### (2) Air crew

- (a) Pilots
- (b) Airborne communications specialists
- (c) Support

###### (3) Cryptographic

###### (4) Support

##### b. Support for functional items

##### c. Means of dissemination

##### d. Facilities and utilities for personnel and equipment

##### e. Logistic support

- (1) Reporting of needs
- (2) Supply system
- (3) Transportation; air, sea, land
- (4) Handling and distribution

##### f. Specialist personnel support

##### g. General personnel support

- (1) Clothing
- (2) Services
- (3) Food
- (4) Protection
- (5) Medical

##### h. Training

##### i. Administration

## 5. COMPONENT SERVICES REQUIREMENTS

### a. Aircraft control

- (1) Ground
- (2) Control zone
- (3) Airdrome
- (4) Enroute

### b. Navigational aids

- (1) Directional
- (2) Non-directional
- (3) Position determining
- (4) Direction finding
- (5) Long range systems

### c. Approach control

### d. Instrument landing aids

- (1) Locating
- (2) Control
- (3) Direction

### e. Communications

- (1) Ground to ground
- (2) Ground to air

### f. Communications support for Air Weather Service

### g. Message traffic handling

- (1) Processing
- (2) Interception
- (3) Relay
- (4) Delivery

### h. Cryptographic capabilities

### i. Facilities flight check requirements

- (1) Carriers
- (2) Airborne checkout equipment

### j. Special projects and services

## FUNCTIONAL IMPLICATIONS OF AIR RESCUE SERVICE

### 1. DEFINITION

- a. The Air Rescue Service is the Air Force activity responsible for providing air rescue organizations, facilities and services.
- b. Air rescue is the search for, rendering aid to, and rescue of personnel involved in aircraft incidents.
- c. An aircraft incident is an aircraft disaster, accident, crash landing, ditching, or abandonment, which does not occur in the proximity of an air base.
- d. A rescue facility is an organization or unit consisting of personnel and equipment assigned for search and rescue.
- e. A rescue control center is an installation consisting of personnel and communications facilities, established for the purpose of effecting control of search and rescue operations.
- f. Rescue control is the direction of air rescue operations.
- g. Operational control of air rescue facilities is the responsibility to exercise rescue control in a specified area; to deploy assigned rescue facilities in the discharge of this responsibility.
- h. Technical control of Air Rescue Service activities is the responsibility for the development and application of air rescue procedures, policies, methods, standards, techniques, and training programs.

### 2. MISSION OF USAF AIR RESCUE SERVICE

The Air Rescue Service will:

- a. Provide world-wide air rescue service.
- b. Maintain assigned rescue facilities in operational readiness in support of combat operations.
- c. Provide air evacuation in support of combat operations.
- d. Render air rescue service to civil and military aviation of the United States and other countries.
- e. Perform other missions.

### 3. RESPONSIBILITIES OF THE AIR RESCUE SERVICE

- a. The administration and technical control of all Air Rescue Service organizations.
- b. The operational control of Air Rescue Service facilities within the zone of interior and within other areas if directed by the Chief of Staff, USAF.
- c. Advising the Chief of Staff, USAF, and commanders of major air commands on all matters pertaining to air rescue.
- d. Representing the Chief of Staff, USAF, where Air Force representation in behalf of air rescue activities is required.
- e. Preparing appropriate directives pertaining to air rescue, including new or revised technical operating procedures and standing operating procedures to insure uniformity of training standards, techniques, and procedures.

- f. Planning and coordinating rescue facility requirements and informing interested components of the Air Force on matters pertaining thereto.
- g. Advising Air Force oversea area commanders concerning rescue facility requirements for their areas, and establishing liaison to coordinate plans for inter-area cooperation in air rescue operations and related activities.
- h. Cooperating and coordinating with the following agencies on matters pertaining to air rescue in accordance with applicable Air Force regulations and Department of Defense policies:
  - (1) Air Coordinating Committee
  - (2) International Civil Aviation Organization
  - (3) Civil Aeronautics Administration
  - (4) United States Coast Guard
  - (5) Civil Air Patrol
  - (6) Other agencies of the United States and foreign governments participating in, or interested in, air rescue.
- i. Participating in disaster relief and other domestic emergencies as requested by the numbered air forces under the Continental Air Command.

#### 4. GENERAL SUPPORT REQUIRED

##### a. Personnel

- (1) Air crew
- (2) Boat crew
- (3) Communications
- (4) Support

##### b. Support for functional items

- c. Bases, including facilities and utilities for personnel and equipment plus security capabilities.
- d. Logistic support

- (1) Reporting needs
- (2) Supply system
- (3) Transportation; air, sea, land
- (4) Handling and distribution

##### e. Specialist personnel support

##### f. General personnel support

- (1) Clothing
- (2) Services
- (3) Food
- (4) Protection
- (5) Medical

##### g. Training

##### h. Administration

##### i. Navigation



j. Air crew support

- (1) Clothing
- (2) Food
- (3) Escape
- (4) Rescue
- (5) Protection
- (6) Services

k. Boat crew support

- (1) Clothing
- (2) Food
- (3) Escape
- (4) Rescue
- (5) Protection
- (6) Services

l. Mobility

- (1) Air
- (2) Surface

m. Inspection (technical)

5. COMPONENT SERVICES REQUIREMENTS

a. Carriers

- (1) Land and/or surface
- (2) Sea
- (3) Air

b. Sea rescue capabilities

- (1) Location (general)
- (2) Location (pin point)
- (3) Marking
- (4) Sustaining
- (5) Pickup
- (6) Treat and return

c. Surface rescue capabilities

- (1) Arctic
  - (a) Location (general)
  - (b) Location (pin point)
  - (c) Marking
  - (d) Sustaining
  - (e) Pickup
  - (f) Treat and return

(2) Tropical

- (a) Location (general)
- (b) Location (pin point)
- (c) Marking
- (d) Sustaining
- (e) Pickup
- (f) Treat and return

(3) Temperate

- (a) Location (general)
- (b) Location (pin point)
- (c) Marking
- (d) Sustaining
- (e) Pickup
- (f) Treat and return

d. Communications capabilities

- (1) Air to surface
- (2) Surface to surface

e. Alert plans

f. Navigation

- (1) To a point
- (2) Search patterns

g. Search planning and control

h. Emergency capabilities

- (1) Life saving (sea)
- (2) First aid
- (3) Evacuation
- (4) Parachute dropped rescue equipment and supplies

i. Search coordination

- (1) With CAP
- (2) With US Navy

## FUNCTIONAL IMPLICATIONS OF USAF MILITARY FLIGHT SERVICE

1. MISSION OF THE MILITARY FLIGHT SERVICES: Military Flight Service is the responsible agency of the Air Force for the following functions within the continental limits of the United States:

- a. Directing and operating the Flight Service centers.
- b. Developing procedures, methods, and practices for the operation of the Flight Service centers.
- c. Maintaining liaison with air forces, commands, Civil Aeronautics Administration, Airways and Air Communications Service, Air Weather Service, Navy Department, and other interested military and civilian governmental agencies.
- d. Reviewing, analyzing, and evaluation of Flight Service center operating records and reports.
- e. Recommending to Commander, Military Air Transport Service, plans programs, and requirements for Flight Service.
- f. Developing, planning for, and supervising hurricane evacuations of military flights.
- g. Maintaining a network of Flight Service centers that can be implemented in the event of emergency to assume the function of flight advisory issuance required by an accelerated pilot training program.

### 2. RESPONSIBILITIES OF MILITARY FLIGHT SERVICE

- a. Coordination of military aircraft movement with Air Defense agencies.
- b. Flight plan approval in absence of operations offices.
- c. Flight plan approval as requested by base commanders.
- d. Enroute flight plan changes.
- e. Hurricane evacuation planning and execution.
- f. Maintain current and complete file of information which might affect the safety and efficiency of military flying.
- g. Alert D/F nets and coordinate activities in emergencies.
- h. Communications searches for overdue aircraft.
- i. Notify Air Rescue Service if communications search fails.
- j. Prepare and forward reports of alleged flying violations.
- k. In-flight advisories upon pilots request.

### 3. GENERAL SUPPORT REQUIRED

- a. Personnel
- b. Communications and signalling

- (1) Telephone
- (2) Telegraph
- (3) Teletype
- (4) Radio
- (5) Other

- c. Navigation and cruise control

- d. Bases, with facilities and utilities for personnel and equipment
- e. Emergency capabilities
- f. Personnel support, general

- (1) Clothing
- (2) Food
- (3) Services
- (4) Protection
- (5) Medical
- (6) Recreational

#### 4. COMPONENT SERVICES REQUIREMENTS

##### a. Communications

- (1) Ground to air
- (2) Ground to ground

##### b. Plotting

- (1) Data gathering
- (2) Data organising
- (3) Display

##### c. Weather

- (1) Teletype sequences
- (2) Graphical representations
- (3) Forecasts

##### d. Controlling

- (1) Receiving requests
- (2) Analysing requests
- (3) Approval or disapproval

##### e. Reporting violations

- (1) Gathering facts
- (2) Checking facts
- (3) Organising facts
- (4) Preparing violation report

**FUNCTIONAL IMPLICATIONS OF**  
**AIR PHOTOGRAPHIC AND CHARTING SERVICE**

1. **MISSION:** The mission of the Air Photographic and Charting Service is to provide the Air Force with all photographic, aeronautical charting, and video (television) service except those which have been made a specific responsibility of other Air Force commands by the Chief of Staff, USAF.

2. **RESPONSIBILITIES OF THE AIR PHOTOGRAPHIC AND CHARTING SERVICE**

- a. Production of film strips and motion pictures.
- b. Establishment and maintenance of an Air Force photographic documentation program.
- c. The design, compilation, production and/or procurement, storage and distribution of aeronautical charts, aeronautical information publications, air target materials and related materials.
- d. Technical supervision of contracts with industry for scripts, motion pictures, film strips, aeronautical charts, aeronautical information publications, and related materials.
- e. Operational and maintenance of a master aeronautical information office.
- f. Operation and maintenance of a still photographic library to meet mapping, charting and intelligence requirements.
- g. Assume maximum utilization of Air Force motion pictures and film strips.
- h. Operation and maintenance of motion and still picture record center.
- i. Air Force photographic support of the Atomic Energy Program.
- j. Air Force video (television) requirements.
- k. Training in specialized photographic and charting techniques.
- l. Furnishes technical assistance to Headquarters USAF.
- m. Provide still and motion picture services to offices of Headquarters USAF.

3. **GENERAL SUPPORT REQUIRED**

a. **Intelligence**

- (1) Maps and charts
- (2) General

b. **Personnel**

- (1) Air crew
- (2) Photographic technicians
- (3) Photo interpreters
- (4) Video technicians
- (5) Writers, producers, directors and cameramen (video)
- (6) Writers, producers, directors and cameramen (motion picture)
- (7) Audio engineers and technicians
- (8) Cartographers
- (9) Support

- c. Support for functional items
- d. Communications and signalling
- e. Navigation
- f. Bases, with facilities and utilities for personnel and equipment plus defensive capabilities.
- g. Logistic support
  - (1) Reporting needs
  - (2) Supply system
  - (3) Transportation (land, sea, air)
  - (4) Handling, storage and distribution
- h. Emergency capabilities
  - (1) Communications and location
  - (2) Rescue system
  - (3) Survival
  - (4) Escape and evasion
- i. Personnel support general
  - (1) Clothing
  - (2) Services
  - (3) Food
  - (4) Protection
  - (5) Medical
  - (6) Recreational
- j. Air crew support
  - (1) Clothing
  - (2) Services
  - (3) Food
  - (4) Escape
  - (5) Rescue
  - (6) Protection
- k. Mobility
  - (1) Air
  - (2) Surface
- l. Training
  - (1) Air crew
  - (2) Photographic
  - (3) Motion picture
  - (4) Television
- m. Administration
- n. Technical inspection

#### 4. COMPONENT FUNCTION REQUIREMENTS

##### a. Photograph

- (1) Aerial
- (2) Still
- (3) Film strips
- (4) Motion picture

##### b. Aeronautical charting

- (1) Data compilation
- (2) Data reduction and processing
- (3) Original drawing
- (4) Editing
- (5) Reproduction
- (6) Correction and maintenance
- (7) Storage
- (8) Dissemination

##### c. Aeronautical information publications

- (1) Data compilation
- (2) Data reduction and processing
- (3) Writing
- (4) Editing
- (5) Reproduction
- (6) Correction and maintenance
- (7) Storage
- (8) Dissemination

##### d. Air target materials

- (1) Data compilation
- (2) Data reduction
- (3) Data processing
- (4) Reproduction
- (5) Correction and maintenance
- (6) Storage
- (7) Dissemination

##### e. Motion pictures

- (1) Writing
- (2) Filming
- (3) Narration
- (4) Audio
- (5) Editing and cutting
- (6) Printing
- (7) Reproduction
- (8) Dissemination

- (9) Specialized functions
  - (a) Specialized personnel
  - (b) Specialized equipment
- f. Video (television)
  - (1) Equipment
    - (a) Operation
    - (b) Maintenance
  - (2) Writing
  - (3) Production
  - (4) Direction
    - (a) General
    - (b) Technical
  - (5) Transmission
  - (6) Recording
  - (7) Reproduction
- g. World-Wide Aeronautical Information Office
  - (1) Data compilation
  - (2) Data reduction
  - (3) Editing
  - (4) Cataloguing
  - (5) Storage
  - (6) Information service
  - (7) Dissemination
- h. Still Photographic Library
  - (1) Collection
  - (2) Editing
  - (3) Cataloguing
  - (4) Storage
  - (5) Reproduction
  - (6) Dissemination
- i. Photographic Records Centers (movies and stills)
  - (1) Accumulation
  - (2) Cataloguing
  - (3) Filing and maintenance



## USAF SECURITY SERVICE

### FUNCTIONAL IMPLICATIONS OF THE SECURITY SERVICE

#### 1. DEFINITIONS:

- a. COMINT.- Intelligence from literal signals
- b. ELINT.- Intelligence from non-literal signals

#### 2. MISSION:

- a. Produce, collect, and disseminate COMINT and ELINT
- b. Intercept foreign communications
- c. Insure security of AF communications
- d. Operate AF special security office system

#### 3. RESPONSIBILITIES:

- a. Exercise command over USAFSS units
- b. Disseminate COMINT and ELINT
- c. Provide ground intercept facilities
- d. Provide specialized training in cryptography
- e. Service test and evaluate cryptographic equipment
- f. Determine crypto material requirements
- g. Provide depot maintenance of crypto equipment
- h. Provide evasion and escape communications

#### 4. GENERAL SUPPORT REQUIRED:

- a. Intelligence
  - (1) Communications nets
  - (2) Maps and charts
  - (3) Enemy capabilities—types of equipment
- b. Personnel
  - (1) Technical specialists
  - (2) Support
- c. Support for functional terms
  - (1) Common terms
  - (2) Special or classified equipment
- d. Communication
  - (1) Point to point
  - (2) Receiving and recording

- e. Bases with facilities and equipment
- f. Logistic support

- (1) Reporting of needs
- (2) Supply system
- (3) Transportation, air, sea, land
- (4) Handling and distribution
- (5) Security control
- (6) Special handling
- (7) Exempt from normal procedures

- g. General personnel support (same as TAC)
- h. Training
- i. Administration

5. COMPONENT FUNCTION REQUIREMENTS:

- a. Intelligence gathering capability (literal)

- (1) Monitoring or receiving
- (2) Recording
- (3) Analysis
- (4) Collation
- (5) Reproducing data
- (6) Reporting
- (7) Disseminating

- b. Intelligence gathering capability (non-literal) (1-7 same as included under intelligence gathering capability, literal).

- c. Personnel training capability

- (1) Intelligence analysis
- (2) Equipment maintenance
- (3) Equipment operation
- (4) Language specialists
- (5) Special restrictions on assignment

- d. Communications, evasion and escape

- (1) Receiving
- (2) Transmitting
- (3) Disseminating data

6. ASSESSMENT OF RESULTS:

- a. Data gathering
- b. Data analysis

7. MOBILITY, PROVISIONS FOR

8. SPECIAL SUPPORT

## THE MEDICAL SERVICE

1. MISSION: To provide necessary medical support.
2. RESPONSIBILITIES AND FUNCTIONS
  - a. Provide medical program
  - b. Train medical personnel - conduct research
  - c. Develop physical standards
  - d. Provide technical advice on medical aspects of equipment design.
  - e. Maintain hospitals
3. GENERAL SUPPORT REQUIRED
  - a. Personnel
    - (1) Specialists
    - (2) General types
  - b. Support of functional items
  - c. Bases with facilities and utilities
  - d. Logistic support
    - (1) Reporting needs
    - (2) Supply system
    - (3) Transportation
    - (4) Handling, storage, distribution, (special considerations).
  - e. Personnel support, general
    - (1) Clothing
    - (2) Food
    - (3) Services
    - (4) Protection
    - (5) Medical
    - (6) Recreational
  - f. Emergency capabilities
  - g. Administration
  - h. Maintenance
4. COMPONENT SERVICES REQUIREMENTS
  - a. Medical
    - (1) Specialist personnel
    - (2) Special equipment
    - (3) General equipment
  - b. Dental
  - c. Veterinary

5. ASSESSMENT OF RESULTS
6. PROVISIONS FOR MOBILITY
7. SPECIAL SUPPORT

- a. Bases, utilities
- b. Logistic support

## AIR UNIVERSITY

1. MISSION: The mission of the Air University is to prepare officers for command and staff duties; provide education necessary for the USAF, and instruction in aviation medicine, and function as a doctrinal and research center.

### 2. RESPONSIBILITIES

#### a. Operate

- (1) Academic schools
- (2) Medical schools
- (3) Climatic studies

#### b. Develop

- (1) Doctrines
- (2) Staff studies
- (3) Climatic studies
- (4) Training literature

### 3. GENERAL SUPPORT REQUIRED

#### a. Intelligence

#### b. Personnel

- (1) General support
- (2) Special academic

#### c. Support for functional items

#### d. Communications

#### e. Bases

- (1) Normal housing
- (2) Instruction facilities

#### f. Logistic support

- (1) Reporting of needs
- (2) Supply system
- (3) Transportation

- (a) Air
- (b) Land
- (c) Water

- (4) Handling and distribution

#### g. General personnel support

#### h. Training

1. Administration

4. COMPONENT ORGANIZATIONS REQUIREMENTS

a. Academic schools

(1) Academic data

- (a) Gathering
- (b) Analysing and organizing
- (c) Preparing
- (d) Reproducing
- (e) Distributing

(2) Policy and doctrine

(As above)

(3) Training equipment

(a) Duplication

- 1. Designing
- 2. Manufacturing
- 3. Reproducing

(b) Simulation

- 1. Audible
- 2. Visual
- 3. Tactile
- 4. Olfactory
- 5. Taste

(c) Representation

(d) Graphic portrayal

b. Medical schools

- (1) Academic data
- (2) Policy and doctrine
- (3) Training equipment
- (4) Medical equipment

- (a) Environmental simulation
- (b) Sensory simulation
- (c) Testing
- (d) Measuring
- (e) Evaluating
- (f) Tabulating
- (g) Transporting
- (h) Special handling
- (i) Research and laboratory

c. Climatic studies

- (1) Recording
- (2) Simulating
- (3) Evaluating
- (4) Tabulating

5. ASSESSMENT OF RESULTS

- a. Data gathering
- b. Data analysis

6. MOBILITY, PROVISIONS FOR

- a. Mobility of special equipment

7. SPECIAL SUPPORT

- a. Intelligence
- b. Personnel
- c. Support for functional items
- d. Special facilities
- e. Logistic support
- f. Training

## FUNCTIONAL IMPLICATIONS OF U.S. AIR FORCE BASES

1. Bases, with all facilities and utilities for personnel and equipment, plus defensive capability.

a. Administration, control, maintenance, and supply facilities and structures.

- (1) Office, shop, and stores, buildings and furnishings.
- (2) Control towers and guidance systems.
- (3) Maintenance and repair shelters and stands.
- (4) Maintenance, repair and shop tools.

b. Aircraft landing, support and shelter facilities, and structures.

- (1) Runways, taxiways, aprons, and hardstands.
- (2) Airfield lighting and marker systems.
- (3) Ground support for weapon systems.
- (4) Aircraft shelters.

c. Personnel housing, messing, recreation, and medical facilities.

- (1) Housing and mess halls
- (2) Bakeries and laundries
- (3) Recreation areas, commissary and exchanges
- (4) Hospital and sanitary services

d. Utility and supply services

- (1) Lighting and power supplies
- (2) Water supply
- (3) Gas supplies
- (4) Utilities distribution systems

e. Communications systems

- (1) Telephone
- (2) Teletype
- (3) Ground to ground radio

f. Policing and defensive systems

- (1) Air police
- (2) Passive defense measures
  - (a) Air raid warning and shelters
  - (b) Camouflage and dispersion
  - (c) Decontamination
- (3) Active defense measures



g. Construction, transportation, and materials handling facilities.

- (1) Clearing, grading and surfacing roads and airfields.
- (2) Erection and hoisting
- (3) Fire fighting and crash rescue
- (4) Heavy haulage and salvage
- (5) Personnel and general haulage
- (6) Warehouse and supply material handling

h. Exterior utility distribution, storage, and protective systems.

- (1) Stand-by power
- (2) Utility metering
- (3) Natural gas odorizing
- (4) Electric power distribution
- (5) Fuel storage and distribution
- (6) Sewage disposal

i. Permanent plants and installations.

- (1) Steam and hot water installations
- (2) Compressed air installations
- (3) Overhead hoisting and moving systems
- (4) CO<sub>2</sub> generation
- (5) Water softening
- (6) Power generation
- (7) Marine docks

j. Semi-permanent plants and service installations.

- (1) Air conditioning and ventilating systems
- (2) Refrigeration systems
- (3) Heating systems
- (4) Elevating and weighing systems
- (5) Drainage systems

## FUNCTIONAL IMPLICATIONS OF AIR INTELLIGENCE

### 1. DEFINITIONS

- a. Air Intelligence.- Knowledge achieved by logical analysis and interpretation of available data concerning one or more aspects of foreign nations, air forces, and areas which are immediately or potentially significant to planning Air Force operations.
- b. Intelligence information.- Materials of every description which are used in the production of air intelligence, including facts, observations, reports, photographs, documents, materials, and so forth.

2. MISSION: The mission of Air Force Intelligence is to collect, produce, and disseminate air intelligence to:

- a. Prevent strategic, tactical, or technological surprise from any source.
- b. Provide a sound basis for counsel upon air preparedness.
- c. Support the planning and conduct of air operations. (AFR 200-5)

### 3. RESPONSIBILITIES OF USAF AIR INTELLIGENCE ORGANIZATIONS

- a. Determining intelligence requirements and obtaining data required.
- b. Producing air intelligence, including medical and aero-medical.
- c. Disseminating and exchanging air intelligence and intelligence information.
- d. Coordination with other intelligence agencies.
- e. Training
- f. Maintenance of air intelligence data.

### 4. GENERAL SUPPORT REQUIRED

#### a. Personnel

##### (1) Intelligence specialists

- (a) Linguists
- (b) Photo interpreters
- (c) Technical specialists
- (d) Interrogators

##### (2) Support

- b. Support for functional items
- c. Means of dissemination and transmission
- d. Facilities and utilities for personnel and equipment
- e. Logistic support

- (1) Reporting of needs
- (2) Supply system

- (3) Transportation; air, sea, land
- (4) Handling and distribution
- f. Specialist personnel support
- g. General personnel support

- (1) Clothing
- (2) Services
- (3) Food
- (4) Protection
- (5) Medical

- h. Training
- i. Administration

## 5. SOURCES OF INTELLIGENCE INFORMATION

- a. Photographic
- b. Personnel
  - (1) Friendly
  - (2) Enemy
- c. Documents
- d. Equipment
- e. Electronic (including infra-red)
  - (1) Ground
  - (2) Airborne

## 6. SOURCE EXPLOITATION REQUIREMENTS

- a. Photographic
  - (1) Collection
    - (a) Assessment equipment in aircraft of tactical commands
    - (b) Strategic and tactical reconnaissance
    - (c) Military, civilian, government, private sources
  - (2) Processing and preparation
  - (3) Analysis, collation, comparison
    - (a) Collation and comparison
    - (b) Analysis and interpretation
  - (4) Reporting
  - (5) Reproduction
  - (6) Dissemination or transmission
  - (7) Presentation of data to user
  - (8) Recording, collating, indexing for future use
  - (9) Maintenance and disposition of data

(10) Special support

- (a) Personnel
- (b) Support for functional items
- (c) Facilities and utilities for personnel and equipment
- (d) Logistic support
- (e) Specialist personnel support
- (f) General personnel support
- (g) Training
- (h) Administration

b. Personnel

(1) Collection

- (a) Friendly
- (b) Enemy

(2) Recording

- (3) Processing and preparation
- (4) Analysis, collation, comparison

- (a) Collation and comparison
- (b) Analysis and interpretation

(5) Reporting

- (6) Reproduction
- (7) Dissemination or transmission
- (8) Presentation of data to user
- (9) Recording, collating, indexing for future use
- (10) Maintenance and disposition of data
- (11) Special support

- (a) Personnel
- (b) Support for functional items
- (c) Facilities and utilities for personnel and equipment
- (d) Logistic support
- (e) General personnel support
- (f) Training
- (g) Administration

c. Documents

- (1) Collection and/or indexing
- (2) Recording
- (3) Processing and preparation
- (4) Analysis, collation, comparison

- (a) Collation and comparison
- (b) Analysis and interpretation

(5) Reporting

- (6) Reproduction
- (7) Dissemination or transmission
- (8) Presentation to user
- (9) Recording, collating, indexing for future use
- (10) Maintenance and disposition of data
- (11) Special support
  - (a) Personnel
  - (b) Support for functional items
  - (c) Facilities and utilities for personnel and equipment
  - (d) Logistic support
  - (e) Personnel support
  - (f) Training
  - (g) Administration

d. Equipment

- (1) Collection
- (2) Processing and preparation for shipment or examination
- (3) Analysis, comparison, test
- (4) Reporting
- (5) Reproduction (of reports)
- (6) Shipment and storage, handling of equipment
- (7) Dissemination or transmission of reports
- (8) Recording, collating, indexing for future use
- (9) Maintenance and disposition of data and equipment
- (10) Special support
  - (a) Personnel
  - (b) Support for functional items
  - (c) Facilities and utilities for personnel and equipment
  - (d) Logistic support
  - (e) Personnel support
  - (f) Training
  - (g) Administration

e. Electronic

- (1) Ground
  - (a) Collection and recording
  - (b) Processing
  - (c) Analysis, collation, comparison
    - 1 Collation and comparison
    - 2 Analysis and interpretation
  - (d) Reporting
  - (e) Reproduction
  - (f) Dissemination or transmission
  - (g) Presentation to user
  - (h) Recording, collating, indexing for future use

- (i) Maintenance and disposition of data
- (j) Special support

- 1 Personnel
- 2 Support for functional items
- 3 Facilities and utilities for personnel and equipment
- 4 Logistic support
- 5 Personnel support
- 6 Training
- 7 Administration

(2) Air

- (a) Collection (see strategic and tactical electronic reconnaissance)
- (b) Processing
- (c) Analysis, collation, comparison

- 1 Collation and comparison
- 2 Analysis and interpretation

- (d) Reporting
- (e) Reproduction
- (f) Dissemination or transfer
- (g) Presentation to user
- (h) Recording, collating, indexing for future use
- (i) Maintenance and disposition of data
- (j) Special support

- 1 Personnel
- 2 Support for functional items
- 3 Facilities and utilities for personnel and equipment
- 4 Logistic support
- 5 Personnel support
- 6 Training
- 7 Administration

7. COUNTER INTELLIGENCE

a. Objective.- To destroy or minimize the effectiveness of the enemy intelligence system.

b. Means:

- (1) Security
- (2) Camouflage
- (3) Concealment
- (4) Deception
- (5) Countering:

- (a) Sabotage
- (b) Propaganda
- (c) Subversion

c. Requirements

(1) Security

- (a) Military information
- (b) Physical; protection from mutiny, riot, strike, sabotage, espionage, and treason

(2) Concealment

- (a) Cover
- (b) Camouflage
- (c) Screens

(3) Censorship

(4) Counter propaganda

(5) Deception

- (a) Feints
- (b) Demonstrations
- (c) Simulated concentrations
- (d) False targets
- (e) False communications
- (f) Decoys and dummies
- (g) Bait

1 Equipment

2 Personnel

2 Documents

(6) Special support

- (a) Personnel
- (b) Support for functional items
- (c) Facilities for personnel and equipment
- (d) Logistic support
- (e) Training
- (f) Administration

## SUPPORT OF FUNCTIONAL ITEMS

### FUNCTIONAL IMPLICATIONS OF SUPPORT OF FUNCTIONAL ITEMS

Includes all implements or devices which are required to repair, overhaul, assemble, disassemble, test, inspect, handle, and/or otherwise maintain an aircraft or its components, including those vehicles and items of equipment used to refuel, service, tow, and provide an auxiliary source of electric power for aircraft.

#### 1. MAINTENANCE

- a. Inspecting
- b. Testing
- c. Servicing

##### (1) Overhauling

###### (a) Disassembling

###### 1 Special tooling

- (b) Inspecting components
- (c) Repairing components
- (d) Test components
- (e) Reassembly

###### 1 Special tooling

##### (2) Handling

###### (a) Lifting

- 1 Slinging and spreading
- 2 Pneumatic

- (b) Conveying
- (c) Hauling
- (d) Storing

##### (3) Spraying

- (a) Decontaminating
- (b) Cleaning
- (c) Deicing

- (4) Jack manifolding
- (5) Lubricating
- (6) Air conditioning

- (a) Heating
- (b) Cooling



- (c) Dehumidifying
- (d) Ventilating and blowing
- (e) Ducting

(7) System supporting

- (a) Compressed air generating, storing, supplying
- (b) Compressed gas generating, storing and supplying
- (c) Liquified gas generating, storing and supplying
- (d) Electrical power supplying

- 1 Charging
- 2 Converting
- 3 Distributing
- 4 Generating

- (e) Hydraulic fluid supplying

(8) Refueling

- (a) Fuel transporting, local
- (b) Fuel distributing, local

- 1 Fixed hydrant supplying
- 2 Portable pipeline supplying
- 3 Fluid segregating
- 4 Liquid storing and transferring

(9) Protecting

- (a) Covering
- (b) Shielding
- (c) Screening

(10) Engine flushing and cleaning

2. AIRCRAFT MOVING

- a. Towing
- b. Connecting

3. AIRCRAFT BLOCKING AND MOORING

4. SHELTERING AND POSITIONING

- a. Aircraft sheltering
- b. Equipment sheltering
- c. Maintenance personnel and equipment sheltering
- d. Maintenance personnel positioning

5. JET BLAST DEFLECTING
6. TESTING, MEASURING AND CALIBRATING

### APPENDIX III

#### LIST OF USAF FUNCTIONS

The following list of functions was derived from a study of the missions and responsibilities of all USAF commands and services.

##### Ground support of functional items:

Towing - hauling  
Hoisting  
Refueling  
Spraying  
Jacking and jack manifolding  
Lubricating  
Gas compressing  
Gas and liquified gas generating  
Flushing and cleaning  
Conveying - gravity and power  
Ventilating and blowing  
Aircraft material hauling  
Aircraft material lifting  
Air conditioning, heating, cooling,  
and dehumidifying  
Parachute repairing  
Slinging and spreading  
Charging and converting  
Fluid segregating  
Tool using  
Aircraft towing  
Aircraft blocking and mooring  
Climbing (ladders)  
Slinging (aircraft engines)  
Sheltering and housing (stands and  
shelters)  
Liquid storing and transferring  
Gas storing and transferring  
Liquified gas storing and  
transferring  
Blast deflecting  
Protective shielding  
Portable lighting  
Aircraft protective screening  
Electrical distributing - auxiliary  
Electrical generating - auxiliary  
Testing and maintaining  
Measuring and calibrating  
Covering and protecting  
Ducting  
Aircraft pneumatic lifting

Communication, control, signalling  
Air and ground based navigation,  
command control  
Weather data gathering and recording  
(ground)  
Materials handling  
Emergency communication and location  
Survival kits, boats, rafts,  
parachutes  
Evasion and escape  
Personnel and air crew clothing,  
including G-suits  
Air crew escape  
Escape - slides and chutes, ejection  
seats, canopy releases  
Personnel and air crew protection  
Personnel and air crew services -  
oxygen, pressurizing, condition-  
ing, relief  
Personnel and air crew food  
Medical  
Training  
Administration  
Weapons carriers, manned  
Weapons carriers, unmanned  
Achieving speed by propulsion  
Achieving speed by airframe  
Achieving altitude by propulsion  
Achieving altitude by airframe  
Deception  
False targets  
False influences  
Surprise  
Defensive countermeasures  
Spoofing and jamming  
Carrying parasites  
Airborne guns  
Air launched missiles  
Fire control  
Evasive action  
Camouflage  
Armor  
Weapons, nuclear

Weapons, HE  
 Weapons, BW  
 Weapons, CW  
 Weapons, psychological warfare  
 Weapons, anti-naval  
 Airborne weapons, launching, release  
 Missile or weapons aiming, guidance  
 Target location, identification and marking  
 Airborne identification, detection warning  
 Communications security  
 Landing and traffic control  
 Station keeping  
 Weapon selection  
 Assessment of results - data gathering  
 Assessment of results - data analysis  
 Aerial towing, coupling  
 Provisions for mobility  
 Electronic reconnaissance data gathering and recording  
 Electronic reconnaissance analysis  
 Weather reconnaissance data gathering and recording  
 Weather data analysis  
 Assistance for gathering visual reconnaissance data  
 Visual reconnaissance data recording  
 Aerial cameras and components  
 Camera mounts and stabilizers  
 Photo processing ground and air  
 Radar, television, fax, and data transmission and recording  
 Photo analysis and interpretation  
 Photo reproduction  
 Illumination - air photographic  
 Aeronautical chart data gathering  
 Geodetic control  
 Photogrammetric analysis and compilation  
 Illuminant launching or release  
 Illuminant guidance  
 Intercept control  
 Ground cargo handling, loading and unloading  
 Aircraft (installed) loading and unloading  
 Cargo restraint  
 Pay load installation

Jettisoning  
 Personnel boarding and unloading  
 Personnel seating  
 Ground based identification, detection, warning  
 Data relay  
 Long range collection  
     (a) Long range camera  
     (b) Other (classified)  
 Target seekers  
 Aeronautical chart reproduction  
 Aerial resupply  
 Air evacuation (medical)  
 Control towers  
 Shop tools  
 Airfield lighting and marking  
 Hangars  
 Portable shelters  
 Lighting and electric power supply and distribution (except auxiliary)  
 Water supply and distribution  
 Gas supply and distribution  
 Air raid warning and shelters  
 Decontamination  
 Active defense  
 Clearing, grading, surfacing roads, hardstands, runways  
 Erection and hoisting  
 Structural fire fighting  
 Crash fire crash rescue  
 Utility metering  
 Natural gas odorizing  
 Liquid storage and distribution  
 Sewage disposal  
 Steam power installations  
 Compressed air installations  
 Water softening except aircraft servicing  
 Refrigeration  
 Heating, except servicing  
 Aircraft weighing  
 Drainage  
 Ground observer detection ranging and tracking  
 Command review and display of battle information  
 Ground guns  
 Ground launched missiles  
 Contamination detection  
 Intelligence analysis, collation and comparison  
 Recording, collating, indexing

Stock controlling  
 Stock requirement computing  
 Storing  
 Transporting (except air)  
 Salvaging (baling, electro-magnetic hoists)  
 Packaging  
 Crash marking (land and water)  
 Rescue pick-up  
 Message and equipment pick-up  
 Permanent shelter and housing  
 Research, development and operational testing (special equipment and facilities)  
 Cryptology  
 Installation (base and building)  
 Personal luggage  
 Aircraft fire prevention and extinguishing  
 Aircraft hazard warning  
 Aircraft defogging, defrosting and deicing  
 Aircraft windshield wiping  
 Aircraft deceleration  
 Aircraft assist take-off  
 Aircraft engine mounting  
 Actuation - (airborne)  
 Aircraft alighting (including shock absorbing, braking, steering)  
 Aircraft stabilizing  
 Aircraft instrumentation  
 Aircraft fuel storage and distribution

Providing for aircraft visibility (windshields, radomes)  
 Aircraft propulsion  
 Flight and power plant control systems  
 Airborne purging systems  
 Aircraft engine starting  
 Aircraft engine anti-detonant injection system  
 Aircraft engine exhaust systems  
 Aircraft furnishings - safety and utility  
 Aircraft insulating, sound proofing and padding  
 Rotary wing aircraft transmission systems  
 Launching and catapulting  
 Arresting  
 Wind direction indicating  
 Missile recovery  
 Printing and reproducing  
 Propellers  
 Wings, rotary  
 Carrying and release of external stores  
 Aircraft auxiliary powering  
 Aerial refueling  
 Airborne air conditioning, cooling and heating  
 Airborne pressurizing  
 Aircraft lighting  
 Power generation - aircraft servicing (electrical, hydraulic, pneumatic, mechanical and multi-purpose)  
 Weapons, general purpose

## APPENDIX IV

### PRELIMINARY PLANS

The seven individual plans for designers' handbooks listed below and detailed in this appendix were prepared with a view to ascertaining the most satisfactory form which the final handbook plan should take:

Plan "A" Classification Breakdown Concept

Plan "B" Weapon System Concept

Plan "C" Functional Concept

Plan "D" ASTIA Distribution Guide Concept

Plan "E" ARDCM 80-4 Technical Groupings Concept

Plan "F" Air - Personnel - Ground Concept

Plan "G" Systems Concept

In preparing the individual plans described in this appendix, their preliminary nature was recognized and, pending final evaluation, effort was kept within reasonable limits. As a result, certain functions were not allocated to particular handbook subdivisions, but were designated as "Unclassified".

## APPENDIX IV

### PRELIMINARY PLAN "A"

(Based on an Industrial Classification concept)

#### HANDBOOK OF INSTRUCTIONS FOR DESIGNERS OF USAF EQUIPMENT

##### VOLUME I

##### AIRCRAFT AND PARTS

- Part One : Airplanes, Gliders, Dirigibles, Balloons, and Missiles
- Part Two : Aircraft Engines and Engine Parts
- Part Three : Aircraft Propellers and Propeller Parts
- Part Four : Aircraft Parts and Auxiliary Equipment

##### VOLUME II

##### MOTOR VEHICLES AND MOTOR VEHICLE EQUIPMENT

- Part One : Motor Vehicles
- Part Two : Truck Trailers
- Part Three : Motor Vehicle Parts and Accessories

##### VOLUME III

##### ELECTRICAL MACHINERY, EQUIPMENT AND SUPPLIES

- Part One : Electrical Generating, Transmission, Distribution, and Industrial Apparatus
- Part Two : Insulated Wire and Cable
- Part Three : Electrical Equipment for Motor Vehicles and Aircraft
- Part Four : Electric Lamps
- Part Five : Communications Equipment and Related Products
- Part Six : Miscellaneous Electrical Products

##### VOLUME IV

##### ORDNANCE AND ACCESSORIES

- Part One : Aircraft Guns and Related Equipment
- Part Two : Ammunition, including Bombs, Mines, Torpedoes, Depth Charges and Chemical Warfare Projectiles
- Part Three : Sighting and Fire Control Equipment

## VOLUME V

### MACHINERY (EXCEPT ELECTRICAL)

- Part One : Internal Combustion Engines
- Part Two : Wheel-Type and Track-Laying Tractors
- Part Three : Airport Construction Equipment
- Part Four : Metalworking Machinery
- Part Five : Pumps, Compressors, and Pumping Equipment
- Part Six : Exhaust Blowers and Ventilating Fans
- Part Seven : Material Handling Trucks, Tractors, Trailers and Stackers
- Part Eight : Miscellaneous Machinery and Equipment

## VOLUME VI

### FABRICATED METAL PRODUCTS (EXCEPT ORDNANCE, MACHINERY AND TRANSPORTATION EQUIPMENT)

- Part One : Hand Tools and General Hardware
- Part Two : Heating Apparatus (Except Electrical)
- Part Three : Fabricated Structural Metal Products
- Part Four : Lighting Fixtures
- Part Five : Miscellaneous Fabricated Metal Products

## VOLUME VII

### CONTROLLING AND TEST INSTRUMENTS AND ASSEMBLIES, AND PHOTOGRAPHIC EQUIPMENT AND SUPPLIES

- Part One : Laboratory, Scientific and Engineering Instruments
- Part Two : Mechanical Measuring and Controlling Instruments
- Part Three : Photographic Equipment and Supplies

## VOLUME VIII

### GENERAL PROCEDURES AND CONSIDERATIONS

- Part One : Research and Development Practices
- Part Two : Standard or Accepted Design Practices
- Part Three : General Test Methods and USAF Approval Policies
- Part Four : Structural Factors
- Part Five : Production Factors
- Part Six : Human Engineering
- Part Seven : Use Factors
- Part Eight : External Service Factors
- Part Nine : Components, Accessories and Parts
- Part Ten : Ground Supporting Systems



## ALLOCATION OF FUNCTIONS WITHIN PLAN "A"

### AIRCRAFT AND PARTS

Air crew escape	Armor
Personnel and air crew protection	Towing, coupling
Personnel and air crew services	Aircraft (installed) loading and unloading
Training	Cargo restraint
Weapons carriers, manned	Jettisoning
Weapons carriers, unmanned	Aerial resupply
Achieving speed	Ground launched missiles
Achieving altitude	
Carrying parasites	

### MOTOR VEHICLES AND MOTOR VEHICLE EQUIPMENT

Ground support of functional items	Ground Cargo handling, loading and unloading
Communication, control, signalling	Structural fire fighting
Personnel and air crew food	Crash fire crash rescue
Medical	
Training	

### ELECTRICAL MACHINERY, EQUIPMENT AND SUPPLIES

Ground support of functional items	Station keeping
Air support of functional items	Assessment of results - data gathering
Communication, control, signalling	Electronic reconnaissance data gathering and recording
Air and ground based navigation, flight control	Visual reconnaissance recording
Weather service	Radar, television, fax, and data transmission and recording
Emergency communications and location	Geodetic control
Medical	Illuminant aiming and guidance
Training	Intercept control
Deception, false targets influences	Target seekers
Surprise	Airfield lighting and marking
Defensive countermeasures	Lighting and electric power supply and distribution except servicing
Spoofing and jamming	Air raid warning and shelters
Evasive action	Steam power installations
Weapons, psychological warfare	Ground based identification, detection, warning
Missile or weapons aiming, guidance	Data relay
Target location, identification and marking	
Airborne identification, detection, warning	
Communications security	
Landing and traffic control	

### ORDNANCE AND ACCESSORIES

Ground support of functional items  
Air support of functional items  
Communication, control, signalling  
Air and ground based navigation, flight control  
Emergency communications and location  
Survival  
Air crew escape  
Training  
Deception, false targets influences  
Airborne guns  
Air launched missiles  
Fire control

Weapons, HE  
Weapons, CM  
Weapons, anti-naval  
Weapons, psychological warfare  
Weapons, launching, release  
Missile or weapons aiming, guidance  
Target location, identification and marking  
Illumination  
Illuminant launching or release  
Illuminant aiming and guidance  
Active defense  
Ground guns

### MACHINERY (EXCEPT ELECTRICAL)

Ground support of functional items  
Air support of functional items  
Materials handling  
Training  
Administration  
Weapon selection  
Assessment of results - data analysis  
Electronic reconnaissance analysis  
Weather data analysis  
Ground cargo handling, loading and unloading  
Aeronautical chart reproduction  
Shop tools  
Clearing, grading, surfacing roads, hardstands, runways

Erection and hoisting  
Fuel storage and distribution  
Steam power installations  
Compressed air installations  
Gas and liquified gas generation  
Water softening  
Air conditioning and ventilating, except servicing  
Refrigeration  
Weighing  
Drainage  
Contamination detection - decontamination  
Intelligence analysis, collation and comparison

### FABRICATED METAL PRODUCTS (EXCEPT ORDNANCE, MACHINERY, AND TRANSPORTATION EQUIPMENT)

Ground support of functional items  
Air support of functional items  
Air and ground based navigation, flight control  
Materials handling  
Air crew escape  
Personnel and air crew food  
Training  
Administration  
Deception, false targets influences  
Provisions for mobility  
Personnel seating

Air evacuation (medical)  
Control towers  
Shop tools  
Hangars  
Portable shelters  
Fuel storage and distribution  
Steam power installations  
Heating, except servicing  
Intelligence analysis, collation and comparison  
Recording, collating, indexing

## INSTRUMENTS AND PHOTOGRAPHIC EQUIPMENT

Ground support of functional items  
Air support of functional items  
Communication, control, signalling  
Air and ground based navigation, flight control  
Weather service  
Emergency communications and location  
Medical  
Training  
Assessment of results - data gathering  
Weather reconnaissance data gathering and recording  
Assistance for gathering visual reconnaissance data  
Aerial cameras and components  
Camera mounts and stabilizers

Photo processing ground and air  
Photo analysis and interpretation  
Photo reproduction  
Aeronautical chart data gathering  
Photogrammetric analysis and compilation  
Long range collection  
Weighing  
Ground observer detection ranging and tracking  
Contamination detection - decontamination  
Intelligence analysis, collation and comparison  
Recording, collating, indexing

## UNCLASSIFIED

Survival  
Evasion and escape  
Personnel and air crew clothing  
Air crew escape  
Personnel and air crew protection  
Personnel and air crew food  
Training  
Administration  
Deception, false targets influence  
Surprise  
Camouflage  
Weapons, nuclear  
Weapons, BW  
Target location, identification and marking  
Weather data analysis  
Aerial resupply  
Control towers

Hangars  
Water supply and distribution  
Gas supply and distribution  
Air raid warning and shelters  
Decontamination  
Active defense  
Utility metering  
Natural gas odorizing  
Fuel storage and distribution  
Sewage disposal  
Steam power installations  
Compressed air installations  
Marine docks  
Drainage  
Command review and display of battle  
Obstacles (barrage balloons, etc.)

## APPENDIX IV

### PRELIMINARY PLAN "B"

(Based on Prime- and Sub-Contractors' Responsibilities  
under the Weapon System Concept)

1. HANDBOOK OF INSTRUCTIONS FOR DESIGNERS OF AIRCRAFT AND GUIDED MISSILES

To replace existing HIAD. Would include revised sections on aerodynamics, preliminary design and development, configuration, structural design, stress analysis, and structural theory to cover piloted and pilotless airplanes, helicopters, gliders, and guided missiles. Would include requirements for interior design and layout of all equipment, but would exclude design requirements for individual components.

2. HANDBOOK OF INSTRUCTIONS FOR DESIGNERS OF AIRBORNE EQUIPMENT

Would include reciprocating, jet, and rocket engines; propellers and propellants; hydraulic and pneumatic systems; guidance and control systems; electrical and electronic equipment; photographic equipment; instruments, etc.

3. HANDBOOK OF INSTRUCTIONS FOR DESIGNERS OF WEAPON SYSTEM GROUND SUPPORT EQUIPMENT

To include all ground support equipment for which the airframe manufacturer is responsible under the weapon system concept.

4. HANDBOOK OF INSTRUCTIONS FOR DESIGNERS OF AIR BASE EQUIPMENT

To include all ground equipment under USAF technical responsibility other than that covered in HIDWSGSE (3).

5. HANDBOOK OF GENERAL INFORMATION FOR DESIGNERS OF USAF EQUIPMENT

To include sections on psychology and human engineering; production and management; personnel and training; physics, astronomy, geophysics, geography, mathematics, materials, fuels and combustion; fluid mechanics; general design procedures and considerations; production methods, techniques and controls; environment; information that is generally applicable to all USAF equipment.

## ALLOCATION OF FUNCTIONS WITHIN PLAN "B"

### Aircraft and Guided Missiles

Personnel and air crew protection  
Training  
Weapons carriers, manned

Weapons carriers, unmanned  
Armor  
Ground launched missiles

### Airborne Equipment

Air support of functional items  
Communication, control, signalling  
Air and ground based navigation, flight control  
Weather service  
Materials handling  
Emergency communications and location  
Survival  
Evasion and escape  
Personnel and air crew clothing  
Air crew escape  
Personnel and air crew protection  
Personnel and air crew service  
Personnel and air crew food  
Medical  
Achieving speed  
Achieving altitude  
Surprise  
Deception, false targets influences  
Defensive countermeasures  
Spoofing and jamming  
Carrying parasites  
Airborne guns  
Air launched missiles  
Fire control  
Evasive action  
Weapons, nuclear  
Weapons, HF  
Weapons, BW  
Weapons, CW  
Weapons, psychological warfare  
Weapons, anti-naval  
Weapons, launching, release  
Missile or weapons aiming, guidance  
Target location, identification and marking  
Airborne identification, detection, warning  
Communications, security

Landing and traffic control  
Station keeping  
Assessment of results - data gathering  
Assessment of results - data analysis  
Towing, coupling  
Provisions for mobility  
Electronic reconnaissance data gathering and recording  
Electronic reconnaissance analysis  
Weather reconnaissance data gathering and recording  
Assistance for gathering visual reconnaissance data  
Visual reconnaissance recording  
Aerial cameras and components  
Camera mounts and stabilizers  
Photo processing, ground and air  
Radar, television, fax, and data transmission and recording  
Illumination  
Aeronautical chart data gathering  
Geodetic control  
Illuminant launching or release  
Illuminant aiming and guidance  
Intercept control  
Aircraft (installed) loading and unloading  
Cargo restraint  
Jettisoning  
Personnel seating  
Data relay  
Long range collection  
Target seekers  
Aerial resupply  
Air evacuation (medical)  
Contamination detection - decontamination

### Weapon System Ground Support Equipment

Ground support of functional items  
Communication, control, signalling  
Air and ground based navigation,  
flight control  
Weather service  
Materials handling  
Emergency communications and  
location  
Personnel and air crew protection  
Personnel and air crew food  
Medical  
Training  
Achieving speed  
Achieving altitude  
Deception, false targets influences  
Surprise  
Defensive countermeasures  
Spoofing and jamming  
Carrying parasites  
Airborne guns  
Air launched missiles  
Fire control  
Evasive action  
Weapons, nuclear  
Weapons, HE  
Weapons, BW  
Weapons, CW  
Weapons, psychological warfare  
Weapons, anti-naval  
Weapons, launching, release  
Missile or weapons aiming, guidance  
Target location, identification  
and marking  
Airborne identification, detection,  
warning  
Communications security  
Landing and traffic control  
Station keeping  
Assessment of results - data  
gathering  
Assessment of results - data analysis  
Towing, coupling

Electronic reconnaissance data  
gathering and recording  
Electronic reconnaissance analysis  
Weather reconnaissance data  
gathering and recording  
Assistance for gathering visual  
reconnaissance data  
Visual reconnaissance recording  
Aerial cameras and components  
Camera mounts and stabilizers  
Photo processing, ground and air  
Radar, television, fax, and data  
transmission and recording  
Illumination  
Aeronautical chart data gathering  
Geodetic control  
Illuminant launching or release  
Illuminant aiming and guidance  
Intercept control  
Ground cargo handling, loading  
and unloading  
Cargo restraint  
Jettisoning  
Personnel boarding and unloading  
Data relay  
Long range collection  
Target seekers  
Aerial resupply  
Air evacuation (medical)  
Portable shelters  
Decontamination  
Crash fire crash rescue  
Fuel storage and distribution  
Compressed air installations  
Gas and liquified gas generation  
Elevating and weighting  
Contamination detection - decon-  
tamination

### Air Base Equipment

Communication, control, signalling  
Air and ground based navigation,  
flight control  
Weather service

Airfield lighting and marking  
Hangars  
Lighting and electric power supply  
and distribution except servicing

Materials handling  
 Emergency communications and location  
 Air crew escape  
 Personnel and air crew food  
 Medical  
 Training  
 Administration  
 Deception, false targets influences  
 Surprise  
 Spoofing and jamming  
 Camouflage  
 Missile or weapons aiming, guidance  
 Target location, identification and marking  
 Communications security  
 Landing and traffic control  
 Weapon selection  
 Assessment of results - data gathering  
 Assessment of results - data analysis  
 Provisions for mobility  
 Electronic reconnaissance analysis  
 Weather reconnaissance data gathering and recording  
 Weather data analysis  
 Photo processing ground and air  
 Radar, television, fax, and data transmission and recording  
 Photo analysis and interpretation  
 Photo reproduction  
 Geodetic control  
 Photogrammetric analysis and compilation  
 Intercept control  
 Ground based identification, detection, warning  
 Long range collection  
 Aeronautical chart reproduction  
 Control towers  
 Shop tools

Water supply and distribution  
 Gas supply and distribution  
 Air raid warning and shelters  
 Camouflage  
 Decontamination  
 Active defense  
 Clearing, grading, surfacing roads, hardstands, runways  
 Erection and hoisting  
 Structural fire fighting  
 Crash fire crash rescue  
 Utility metering  
 Natural gas odorizing  
 Fuel storage and distribution  
 Sewage disposal  
 Steam power installations  
 Compressed air installations  
 Gas and liquified gas generation  
 Water softening (except aircraft servicing)  
 Marine docks  
 Air conditioning and ventilating, except servicing  
 Refrigeration  
 Heating, except servicing  
 Elevating and weighting  
 Drainage  
 Ground observer detection ranging and tracking  
 Command review and display of battle  
 Ground guns  
 Contamination detection - decontamination  
 Obstacles (barrage balloons, etc.)  
 Intelligence analysis, collation and comparison  
 Recording, collating, indexing

APPENDIX IV  
PRELIMINARY PLAN "C"

(Based on Functional Areas)

1. Handbook on Air and Ground Support Equipment
2. Communications, Control, Signalling, and Navigation Equipment
3. Transportation, Supply, and Administration Equipment
4. Medical, Dental, Veterinarian, Meteorological, Chemical, and other Equipment
5. Training Equipment
6. Aircraft and Pilotless Aircraft, and Guided Aircraft Rockets
7. Armament
8. Photographic
9. Engineering and Utilities



## Air and Ground Support

Defined as: Servicing, maintaining, handling, assembling, disassembling, etc.

Towing - hauling  
Hoisting  
Refueling  
Spraying  
Jacking and jack manifolding  
Lubricating  
Gas compressing  
Gas and liquified gas generating  
Flushing and cleaning  
Conveying - gravity and power  
Ventilating and blowing  
Aircraft material lifting  
Aircraft material hauling  
Air conditioning, heating, cooling  
and dehumidifying  
Parachute repairing  
Slinging and spreading  
Charging and converting  
Fluid segregating  
Tool using  
Aircraft towing  
Aircraft blocking and mooring  
Climbing (ladders)  
Slinging (aircraft engines)  
Sheltering and housing (stands, and  
shelters)  
Liquid storing and transferring  
Gas storing and transferring  
Liquified gas storing and transferring  
Blast deflecting  
Protective shielding  
Portable lighting  
Aircraft protective screening  
Electrical generating - auxiliary  
Electrical distributing - auxiliary  
Testing and maintaining  
Measuring and calibrating  
Covering and protecting  
Ducting  
Aircraft pneumatic lifting

Carrying parasites  
Towing, coupling provisions for  
mobility  
Ground cargo handling, loading  
and unloading  
Aircraft (installed) loading and  
unloading  
Cargo restraint  
Personnel boarding and unloading  
Personnel seating  
Portable shelters  
Personnel shelters  
Personnel and air crew services  
Weapons launching, release  
(see Armament)  
Assistance for gathering visual  
reconnaissance data  
Fuel storage and distribution  
Compressed air installations  
Gas and liquified gas generation  
Weighing

### Communications, Control, Signalling, Navigation

Communications, control, signalling  
Air and ground based navigation,  
flight control  
Emergency communications and location  
Deception, false targets  
Surprise  
Defensive countermeasures  
Spoofing and jamming  
Evasive action  
Weapons, psychological warfare  
(see Armament)  
Target location, identification  
and marking  
Airborne identification, detection,  
warning  
Communications security  
Landing and traffic control  
Station keeping

Electronic reconnaissance data  
gathering and recording  
Visual reconnaissance recording  
Radar, television, fax, and data  
transmission and recording  
Intercept control  
Ground based identification,  
detection, warning  
Data relay  
Target seekers  
Ground observer detection  
ranging and tracking  
Command review and display of  
battle  
Assessment of results - data  
gathering (see Photographic)  
R & D and operational testing  
Cryptology

### Transportation, Supply and Administration

Materials handling  
Survival  
Personnel and air crew clothing  
Personnel and air crew food  
Administration, includes reproduction  
and printing equipment  
Evasion and escape  
Personnel and air crew protection  
Aerial resupply (also see Air Support)  
Intelligence analysis collation  
and comparison  
Recording, collating, indexing  
Weapon selection  
Assessment of results - data  
evaluation

Provisions for mobility  
Electronic reconnaissance analysis  
Weather data analysis (also see  
Meteorological)  
Stock controlling  
Stock requirement computing  
Storing  
Salvaging  
Transporting  
Packaging  
Hardware  
Aeronautical chart reproduction  
Shop tools  
Parachute repair

### Medical, Dental and Veterinarian, Meteorological, Chemical, and Other

Medical, dental and veterinarian  
Air evacuation (medical)  
Weather service  
Weather reconnaissance data  
gathering and recording

Weather data analysis (see also  
Administration)  
Contamination detection -  
decontamination

## Training

### Training

## Aircraft and Pilotless Aircraft and Guided Aircraft Rockets

Air crew escape (except parachutes)  
Weapons carriers, manned  
Weapons carriers, unmanned  
Air launched missiles  
Ground launched missiles  
R & D and operational testing  
Fire prevention and extinguishing  
Hazard warning  
Defogging, defrosting, and deicing  
Windshield wiping  
Deceleration  
Assist take-off  
Engine mounting  
Actuation (airborne)  
Alighting (including shock absorbing,  
braking, steering)  
Stabilizing  
Instrumentation  
Fuel storage and distribution  
Lubricant storage and distribution

Providing for visibility  
Propulsion  
Flight and power plant control  
systems  
Engine lubrication and cooling  
systems  
Purging systems  
Engine starting  
Anti-detonant systems  
Engine exhaust systems  
Engine air intake systems  
Furnishings - safety and utility  
Insulating, sound proofing, and  
padding  
Rotary wing transmission system  
Achieving speed  
Achieving altitude  
Armor  
Jettisoning

## Armament

Airborne guns  
Fire control  
Weapons, nuclear  
Weapons, high explosive  
Weapons, RW  
Weapons, CW  
Weapons, anti-naval  
Missile or weapons aiming, guidance  
Target identification, location  
and marking

Illuminant launching or release  
Illuminant aiming and guidance  
Weapons, psychological warfare  
(also see Communications)  
Weapons launching, release (also  
see Ground Support)  
Ground guns  
R & D and operational testing  
Active defense

## Photographic

Aerial cameras and components  
Camera mounts and stabilizers  
Photo processing ground and air  
Photo analysis and interpretation  
Photo reproduction  
Illumination  
Assessment of results - data  
gathering (also see Communications)

R & D and operational testing  
Aeronautical chart data gathering  
Geodetic control  
Photogrammetric analysis and  
compilation  
Long range collection

9-150/190

## Engineering and Utilities

Camouflage  
Control towers  
Airfield lighting and marking  
Hangers  
Lighting and electric power supply  
and distribution (except auxiliary)  
Water supply and distribution  
Gas supply and distribution  
Air raid warning and sheltering  
Clearing, grading, surfacing, roads,  
hardstands, runways  
Erection and hoisting  
Structural fire fighting  
Crash fire fighting  
Utility metering  
Natural gas odorizing  
Sewage disposal  
Steam power installations  
Water softening

Marine docks  
Air conditioning and ventilating  
Refrigeration  
Heating (except servicing)  
Drainage  
Permanent shelter and housing  
R & D and operational testing  
Installation (base, building, and  
retrofit equipment)  
Lubricant distribution and storage  
Oxidizer distribution and storage  
Gas and liquified gas distribution  
and storage  
Fuel distribution and storage  
Launching and catapulting  
Arresting  
Wind direction indicating

## Unclassified

Air crew escape (parachutes)  
Crash marking  
Rescue pick-up

Message and equipment pick-up  
Decontamination

APPENDIX IV

PRELIMINARY PLAN "D"

(Based on ASTIA Distribution System)

1. Handbook on Aircraft and Flight Equipment
2. Handbook on Communications Equipment
3. Handbook on Detection Equipment
4. Handbook on Electrical Equipment
5. Handbook on Ground Transportation Equipment
6. Handbook on Guided Missiles
7. Handbook on Engineering Equipment
8. Handbook on Photographic Equipment
9. Handbook on Propulsion Equipment
10. Handbook on Quartermaster Type Equipment
11. Handbook on Research Equipment
12. Handbook on Ordnance Equipment
13. Handbook on Medical Equipment
14. Handbook on Weather Equipment

## ALLOCATION OF FUNCTIONS WITHIN PLAN "D"

### Aircraft and Flight Equipment

Air crew escape  
Personnel and air crew protection  
Training  
Weapons carriers, manned  
Achieving speed

Achieving altitude  
Carrying parasites  
Evasive action  
Armor

### Communications Equipment

Communication, control, signalling  
Air and ground based navigation,  
flight control  
Weather service  
Emergency communications and location  
Training  
Spoofing and jamming  
Weapons, psychological warfare  
Missile or weapons aiming, guidance  
Communications security  
Landing and traffic control  
Station keeping

Assessment of results - data  
gathering  
Electronic reconnaissance data  
gathering and recording  
Visual reconnaissance recording  
Radar, television, fax, and data  
transmission and recording  
Illuminant aiming and guidance  
Intercept control  
Data relay  
Control towers

### Detection Equipment

Communication, control, signalling  
Air and ground based navigation,  
flight control  
Training  
Deception, false targets influences  
Surprise  
Defensive countermeasures  
Spoofing and jamming  
Target location, identification and  
marking  
Airborne identification, detection,  
warning  
Landing and traffic control

Station keeping  
Electronic reconnaissance data  
gathering and recording  
Assistance for gathering visual  
reconnaissance data  
Radar, television, fax, and data  
transmission and recording  
Geodetic control  
Ground based identification,  
detection, warning  
Target seekers  
Ground observer detection ranging  
and tracking

### Electrical Equipment

Ground support of functional items  
Training  
Airfield lighting and marking

Lighting and electric power  
supply and distribution  
except servicing

### Ground Transportation Equipment

Ground support of functional items  
Materials handling  
Training

### Guided Missiles

Training  
Weapons carriers, unmanned  
Carrying parasites

Air launched missiles  
Armor  
Ground launched missiles

### Engineering Equipment

Ground support of functional items  
Materials handling  
Training  
Clearing, grading, surfacing roads,  
hardstands, runways

Erection and hoisting  
Air conditioning and ventilating,  
except servicing  
Refrigeration  
Heating except servicing

### Photographic and Reproduction Equipment

Training  
Assessment of results - data  
gathering  
Aerial cameras and components  
Camera mounts and stabilizers  
Photo processing ground and air  
Photo analysis and interpretation

Photo reproduction  
Aeronautical chart data gathering  
Photogrammetric analysis and  
compilation  
Long range collection  
Aeronautical chart reproduction

### Propulsion Systems

Training  
Achieving speed  
Achieving altitude

### Quartermaster Type Equipment

Ground support of functional items  
Survival  
Evasion and escape  
Personnel and air crew clothing  
Air crew escape

Personnel and air crew protection  
Personnel and air crew services  
Personnel and air crew food  
Administration

### Research Equipment

Ground support of functional items  
Air and ground based navigation,  
    flight control  
Weather service  
Weapon selection  
Assessment of results

Electronic reconnaissance analysis  
Weather data analysis  
Photo analysis and interpretation  
Elevating and weighing  
Intelligence analysis, collation  
    and comparison

### Ordnance Equipment

Airborne guns  
Fire control  
Armor  
Weapons, nuclear  
Weapons, HE  
Weapons, BW  
Weapons, CW  
Weapons, psychological warfare  
Weapons, anti-naval

Weapons, launching, release  
Missile or weapons aiming,  
    guidance  
Target location, identification  
    and marking  
Illuminant launching or release  
Illuminant aiming and guidance  
Active defense  
Ground guns

### Medical Equipment

Medical  
Air evacuation (medical)

### Weather Equipment

Weather reconnaissance data  
    gathering and recording  
Weather data analysis

### Unclassified

Ground support of functional items  
Air support of functional items  
Survival  
Air crew escape  
Personnel and air crew services  
Personnel and air crew food  
Deception, false targets influences  
Camouflage  
Station keeping  
Towing, coupling  
Provisions for mobility  
Photo analysis and interpretation

Portable shelters  
Water supply and distribution  
Gas supply and distribution  
Air raid warning and shelters  
Camouflage  
Decontamination  
Structural fire fighting  
Crash fire crash rescue  
Utility metering  
Natural gas odorizing  
Fuel storage and distribution  
Sewage disposal



Ground cargo handling, loading  
and unloading  
Aircraft (installed) loading  
and unloading  
Cargo restraint  
Jettisoning  
Personnel boarding and unloading  
Personnel seating  
Long range collection  
Aerial resupply  
Control towers  
Shop tools  
Airfield lighting and marking  
Hangars

Steam power installations  
Compressed air installations  
Gas and liquified gas generation  
Water softening (except aircraft  
servicing)  
Marine docks  
Drainage  
Command review and display of  
battle  
Contamination detection -  
decontamination  
Obstacles (barrage balloons, etc.)  
Recording, collating, indexing

## APPENDIX IV

### PRELIMINARY PLAN "E"

(Based on ARDCM 80-4 Technical Groupings Concept)

1. Weapon System Handbook
2. Missile Handbook
3. Handbook of Instructions for Aircraft Designers
4. Handbook of Instructions for Ground Equipment Designers
5. Ground Instrument Support Handbook
6. Base Equipment and its Support Handbook
7. Guidance and Control Handbook
8. Navigation Handbook
9. Electronics Handbook
10. Communications Handbook
11. Propulsion and Fuels Handbook
12. Armament Handbook
13. Flight Operation and Control Handbook
14. Reconnaissance Handbook
15. Photographic Handbook
16. Airborne Instruments and Accessories Handbook
17. Supporting Systems (Active) Handbook
18. Supporting Systems (Passive) Handbook
19. Transportation, Storage, and Packaging Handbook
20. Training and Training Aids Handbook
21. Inspection and Maintenance Handbook
22. Service and Supply Handbook
23. Procurement and Production Handbook
24. Testing Handbook
25. Environment Handbook
26. Human Element and Safety Handbook
27. Vulnerability Handbook
28. Countermeasures Handbook
29. Pertinent Phase of Supporting Sciences Handbook

## ALLOCATION OF FUNCTIONS WITHIN PLAN "E"

### WEAPON SYSTEM HANDBOOK

General information and extracts from all other handbooks.

### MISSILE HANDBOOK

Weapons carriers, unmanned	Air launched missiles
Achieving speed	Armor
Achieving altitude	Ground launched missiles

### HANDBOOK OF INSTRUCTIONS FOR AIRCRAFT DESIGNERS

Weapons carriers, manned	Cargo restraint
Achieving speed	Jettisoning
Achieving altitude	Personnel boarding and unloading
Armor	Personnel seating
Aircraft (installed) loading and unloading	Aerial resupply
	Air evacuation (medical)

### HANDBOOK OF INSTRUCTIONS FOR GROUND EQUIPMENT DESIGNERS

Ground support of functional items	Geodetic control
Air support of functional items	Illuminant launching or release
Air and ground based navigation, flight control	Illuminant aiming and guidance
Air launched missiles	Intercept control
Fire control	Ground cargo handling, loading and unloading
Evasive action	Aircraft (installed) loading and unloading
Weapons, launching release	Cargo restraint
Missile or weapons aiming, guidance	Jettisoning
Airborne identification, detection, warning	Personnel boarding and unloading
Communications security	Personnel seating
Landing and traffic control	Long range collection
Station keeping	Target seekers
Visual reconnaissance recording	Aerial resupply
Aerial cameras and components	Air evacuation (medical)
Camera mounts and stabilizers	Portable shelters
Photo processing, ground and air	Fuel storage and distribution
Radar, television, fax, and data transmission and recording	Compressed air installations
Illumination	Gas and liquified gas generation
Aeronautical chart data gathering	Elevating and weighing
	Contamination detection - decontamination

### GROUND INSTRUMENT SUPPORT HANDBOOK

Ground support of functional items  
Air and ground based navigation,  
flight control  
Weather service  
Airborne identification, detection,  
warning  
Landing and traffic control  
Photo processing, ground and air

Radar, television, fax, and data  
transmission and recording  
Photo analysis and interpretation  
Geodetic control  
Aeronautical chart reproduction  
Active defense  
Fuel storage and distribution  
Ground guns

### BASE EQUIPMENT AND ITS SUPPORT HANDBOOK

Ground support of functional items  
Air and ground based navigation,  
flight control  
Weather service  
Materials handling  
Landing and traffic control  
Radar, television, fax, and data  
transmission and recording  
Control towers  
Shop tools  
Airfield lighting and marking  
Hangars  
Lighting and electric power supply and  
distribution, except servicing  
Water supply and distribution  
Gas supply and distribution  
Air raid warning and shelters  
Camouflage  
Decontamination  
Clearing, grading, surfacing roads,  
hardstands, runways

Erection and hoisting  
Structural fire fighting  
Crash fire crash rescue  
Utility metering  
Natural gas odorizing  
Fuel storage and distribution  
Sewage disposal  
Steam power installations  
Compressed air installations  
Gas and liquified gas generation  
Water softening (except air-  
craft servicing)  
Marine docks  
Air conditioning and ventilating,  
except servicing  
Refrigeration  
Heating, except servicing  
Drainage  
Contamination detection -  
decontamination

### GUIDANCE AND CONTROL

Communication, control, signalling  
Air and ground based navigation,  
flight control  
Missile or weapons aiming, guidance

Geodetic control  
Illuminant aiming and guidance  
Intercept control

### NAVIGATION HANDBOOK

Air and ground based navigation,  
flight control  
Surprise

Station keeping  
Geodetic control

## ELECTRONICS HANDBOOK

Communication, control, signalling  
Air and ground based navigation,  
flight control  
Weather service  
Emergency communications and location  
Deception, false targets influences  
Defensive countermeasures  
Spoofing and jamming  
Fire control  
Weapons, psychological warfare  
Missile or weapons aiming, guidance  
Target location, identification  
and marking

Station keeping  
Assessment of results - data  
gathering  
Electronic reconnaissance data  
gathering and recording  
Visual reconnaissance recording  
Radar, television, fax, and data  
transmission and recording  
Geodetic control  
Intercept control  
Data relay

## COMMUNICATIONS HANDBOOK

Communication, control, signalling  
Air and ground based navigation,  
flight control  
Weather service  
Emergency communications and location  
Defensive countermeasures  
Spoofing and jamming  
Weapons, psychological warfare  
Communications security  
Station keeping

Assessment of results - data  
gathering  
Electronic reconnaissance data  
gathering and recording  
Visual reconnaissance recording  
Radar, television, fax, and data  
transmission and recording  
Intercept control  
Data relay  
Control towers

## PROPULSION AND FUELS HANDBOOK

Achieving speed  
Achieving altitude

## ARMAMENT HANDBOOK

Airborne guns  
Air launched missiles  
Fire control  
Evasive action  
Weapons, nuclear  
Weapons, HE  
Weapons, BW  
Weapons, CW  
Weapons, psychological warfare  
Weapons, anti-naval  
Weapons, launching, release  
Missile or weapons aiming, guidance

Target location, identification  
and marking  
Weapon selection  
Assessment of results - data analysis  
Electronic reconnaissance analysis  
Weather data analysis  
Illumination  
Illuminant aiming and guidance  
Active defense  
Ground guns  
Illuminant launching or release

### FLIGHT OPERATION AND CONTROL HANDBOOK

Communication, control, signalling  
Air and ground based navigation  
flight control  
Deception, false targets influences  
Surprise  
Spoofing and jamming  
Target location, identification and  
marking  
Airborne identification, detection,  
warning

Landing and traffic control  
Station keeping  
Assessment of results - data  
gathering  
Radar, television, fax, and data  
transmission and recording  
Geodetic control  
Ground based identification,  
detection, warning  
Target seekers

### RECONNAISSANCE HANDBOOK

Electronic reconnaissance data  
gathering and recording  
Electronic reconnaissance analysis  
Weather reconnaissance data  
gathering and recording

Aeronautical chart data  
gathering  
Geodetic control

### PHOTOGRAPHIC HANDBOOK

Assessment of results - data gathering  
Aerial cameras and components  
Target mounts and stabilisers  
Photo processing ground and air  
Photo analysis and interpretation  
Photo reproduction  
Illumination

Aeronautical chart data  
gathering  
Geodetic control  
Illuminant launching or release  
Illuminant aiming and guidance  
Long range collection  
Aeronautical chart reproduction

### AIRBORNE INSTRUMENTS AND ACCESSORIES HANDBOOK

Air and ground based navigation,  
flight control  
Carrying parasites  
Landing and traffic control

### SUPPORTING SYSTEMS (ACTIVE) HANDBOOK

Weather service  
Survival  
Evasion and escape

Air crew escape  
Weather reconnaissance data  
gathering and recording

SUPPORTING SYSTEMS (PASSIVE) HANDBOOK

Personnel and air crew clothing  
Personnel and air crew protection  
Personnel and air crew food

Medical  
Camouflage  
Weather data analysis

TRANSPORTATION, STORAGE, AND PACKAGING HANDBOOK

Ground cargo handling, loading and unloading

TRAINING AND TRAINING AIDS HANDBOOK

Training  
Provisions for mobility

INSPECTION AND MAINTENANCE HANDBOOK

SERVICE AND SUPPLY HANDBOOK

PROCUREMENT AND PRODUCTION HANDBOOK

TESTING HANDBOOK

ENVIRONMENT HANDBOOK

Ground support of functional items  
Personnel and air crew services

HUMAN ELEMENT AND SAFETY HANDBOOK

VULNERABILITY HANDBOOK

COUNTERMEASURES HANDBOOK

PERTINENT PHASE OF SUPPORTING SCIENCES HANDBOOK

UNCLASSIFIED

Administration  
Towing, coupling  
Assistance for gathering visual  
reconnaissance data  
Photogrammetric analysis and compilation  
Ground observer detection ranging  
and tracking

Command review and display  
of battle  
Intelligence analysis,  
collation and comparison  
Recording, collating, indexing



## APPENDIX IV

### PRELIMINARY PLAN "F"

(Based on Air, Personnel, and Ground Groupings)

#### 1. SYSTEMS GUIDANCE HANDBOOK

To contain general information pertaining to the operational philosophy, general system requirements, planning factors, and other broad aspects of strategic, tactical, and transport missions.

#### 2. FLIGHT GROUP

- a. Manned Airframe and Airframe Installations Handbook.- To contain design guidance for actual airframe design of manned aircraft, and data on the installation of various systems required for both sustained flight and for combat operations. (HIAD)
- b. Unmanned Airframe and Airframe Installations Handbook.- To contain design guidance for actual airframe design of unmanned aircraft, and data on the installation of various systems required for both sustained flight and for combat operations. (HIDPAGAR. May be combined with (a).)
- c. Installed Airframe Systems Handbook.- To contain design guidance for complete airframe sub-systems, such as the power plant, photographic systems, airborne radiation equipment, electrical systems, hydraulic and pneumatic systems, landing gear, control systems, armament systems, etc. No installation data will be included, but merely the data on how to design and tie-together the sub-system itself.

#### 3. PERSONNEL GROUP

- a. Handbook of Instructions for Designers of Equipment for Personnel Support.- To contain design guidance relating to human engineering, rescue, escape, survival, clothing, parachutes, oxygen masks, and all protective equipment and services which are engineered with the human operator as the primary object acted upon by the equipment. Will include oxygen masks, but not the aircraft oxygen system; flight and ground clothing; flak armor; etc.

#### 4. GROUND GROUP

- a. Bases and Ground Systems Handbook.- To contain design guidance for general design of air force bases and the installation of ground equipment thereon. This will include remote bases for radar, interceptor squadrons, guided missiles groups, etc. General construction criteria, building policies, standards for environment.

will be included. Sections will cover the installed systems aspects of ground functioning equipment, such as ground radar and communications sets tied into air defense systems, ground radar and communications involved in tactical air control systems.

- b. Installed Ground Systems Handbook.- To contain design guidance on all ground systems and related groups of equipment; ground radiation systems, non-aero and aeronautical support, training equipment, AWS equipment, photo processing equipment, computing systems, etc.

## 5. COMPONENT GROUP

To contain industrially organized volumes which are required to present all the equipment - aeronautical and non-aeronautical - in terms of actual component design.

- a. Ordnance and Accessories
- b. Apparel and Accessories
- c. Fabricated Metal Products
- d. Machinery (except electrical)
- e. Electrical Machinery and Equipment
- f. Transportation Equipment
- g. Instruments, Photographic and Optical Equipment
- h. Fabricated Textile Products

## ALLOCATION OF FUNCTIONS WITHIN PLAN "F"

### FLIGHT GROUP

#### Manned Airframe and Airframe Installation Handbook

Air crew escape	Achieving speed
Training	Achieving altitude
Weapons carriers, manned	Armor

#### Unmanned Airframe and Airframe Installation Handbook

Training	Air launched missiles
Weapons carriers, unmanned	Armor
Achieving speed	Ground launched missiles
Achieving altitude	

#### Installed Airframe Systems Handbook

### PERSONNEL GROUP

#### Handbook of Instructions for Designers of Equipment for Personnel Support

### GROUND GROUP

#### Bases and Ground Systems Handbook

#### Installed Ground Systems Handbook

### COMPONENT GROUP

#### Ordnance and Accessories

Ground support of functional items	Weapons, BW
Air support of functional items	Weapons, CW
Communication, control, signalling	Weapons, anti-naval
Air and ground based navigation, flight control	Weapons, launching, release
Emergency communications and location	Target location, identification, and marking
Air crew escape	Illumination
Training	Missile or weapons aiming, guidance
Airborne guns	Illuminant aiming and guidance
Fire control	Active defense
Weapons, nuclear	Ground guns
Weapons, HE	Survival kits

## Apparel and Accessories

Personnel and air crew clothing  
Personnel and air crew protection  
Personnel and air crew services

## Fabricated Metal Products

Ground support of functional items  
Air support of functional items  
Weather service  
Materials handling  
Air crew escape  
Personnel and air crew food  
Training  
Administration  
Deception, false targets influences  
Carrying parasites  
Weapons, launching, release  
Towing, coupling  
Provisions for mobility  
Photo processing ground and air

Ground cargo handling, loading and unloading  
Cargo restraint  
Personnel boarding and unloading  
Personnel seating  
Air Evacuation (medical)  
Control towers  
Airfield lighting and marking  
Portable shelters  
Fuel storage and distribution  
Heating, except servicing  
Intelligence analysis, collation and comparison  
Recording, collating, indexing

## Machinery (except electrical)

Ground support of functional items  
Air support of functional items  
Materials handling  
Personnel and air crew services  
Training  
Administration  
Weapon selection  
Assessment of results - data analysis  
Electronic reconnaissance analysis  
Weather data analysis  
Assistance for gathering visual reconnaissance data  
Camera mounts and stabilizers  
Photo processing ground and air  
Ground cargo handling, loading and unloading  
Aircraft (installed) loading and unloading

Jettisoning  
Aeronautical chart reproduction  
Shop tools  
Decontamination  
Clearing, grading, surfacing roads, hardstands, runways  
Erection and hoisting  
Fuel storage and distribution  
Compressed air installations  
Gas and liquified gas generation  
Water softening except aircraft servicing  
Air conditioning and ventilating, except servicing  
Refrigeration  
Contamination detection - decontamination  
Intelligence analysis, collation and comparison

## Electrical Machinery and Equipment

Ground support of functional items  
Communication, control, signalling

Air support of functional items  
Air and ground based navigation, flight control

Weather service  
 Emergency communications and location  
 Medical  
 Training  
 Deception, false targets influences  
 Surprise  
 Defensive countermeasures  
 Spoofing and jamming  
 Evasive action  
 Weapons, psychological warfare  
 Missile or weapons aiming, guidance  
 Target location, identification and marking  
 Airborne identification, detection and warning  
 Communications security  
 Landing and traffic control

Station keeping  
 Assessment of results - data gathering  
 Electronic reconnaissance data gathering and recording  
 Visual reconnaissance recording  
 Radar, television, fax, and data transmission and recording  
 Geodetic control  
 Illuminant aiming and guidance  
 Intercept control  
 Ground based identification, detection, warning  
 Data relay  
 Target seekers  
 Airfield lighting and marking  
 Lighting and electric power supply and distribution except servicing

#### Transportation Equipment

Ground support of functional items  
 Personnel and air crew food  
 Medical  
 Training  
 Achieving speed

Achieving altitude  
 Ground cargo handling, loading and unloading  
 Structural fire fighting  
 Crash fire crash rescue

#### Instruments, Photographic and Optical Equipment

Ground support of functional items  
 Air support of functional items  
 Communication, control, signalling  
 Air and ground based navigation, flight control  
 Weather service  
 Medical  
 Training  
 Assessment of results - data gathering  
 Weather reconnaissance data gathering and recording  
 Assistance for gathering visual reconnaissance data  
 Aerial cameras and components

Photo processing ground and air  
 Photo analysis and interpretation  
 Photo reproduction  
 Illumination  
 Aeronautical chart data gathering  
 Photogrammetric analysis and compilation  
 Long range collection  
 Ground observer detection ranging and tracking  
 Contamination detection - de-contamination  
 Intelligence analysis, collation and comparison  
 Recording, collation, indexing

#### Fabricated Non-Metallic Products

Ground support of functional items  
 Air crew escape

Target location, identification and marking

Personnel and air crew services  
Training  
Administration  
Deception, false targets influences  
Camouflage

Weather data analysis  
Personnel seating  
Aerial resupply  
Camouflage  
Command review and display of battle

Unclassified

Hangars  
Water supply and distribution  
Gas supply and distribution  
Air raid warning and shelters  
Utility metering  
Natural gas odorizing

Survival kits  
Sewage disposal  
Steam power installations  
Marine docks  
Drainage  
Evasion and escape

## APPENDIX IV

### PRELIMINARY PLAN "G"

(Based on Functions and Systems)

#### 1. BASIC STANDARDS DIVISION

Handbook (s) to include the following:

- a. Weapon System guidance
- b. General information
- c. Instructions for AF equipment designers - air and ground equipment

#### 2. SUSTAINED FLIGHT DIVISION

Handbooks to include the following:

##### a. Manned aircraft, including:

- (1) Controls
- (2) Installation of accessories and sub-systems
- (3) Design requirements
- (4) Helicopter transmissions

##### b. Unmanned aircraft, including:

- (1) Controls
- (2) Installation of accessories and sub-systems
- (3) Design requirements
- (4) Guidance and control
- (5) Recovery systems

##### c. Minor installed systems, including:

- (1) Personnel services - O<sub>2</sub>, pressurization, decompression, conditioning, relief, food, inputs from aircraft sub-systems (radio, G-suit, air conditioning, etc.).
- (2) Parasite towing and coupling - manned and unmanned aircraft, air-air refueling.
- (3) Aircraft installed cargo and personnel handling
- (4) Aircraft jettisoning systems
- (5) Crew seating systems
- (6) Passenger seating systems
- (7) Passive defense - air: physical appearance, false targets influences, spoofing and jamming, surprise, diversion (physical false targets), evasive action, armor.
- (8) Fire detection and extinguishing component arrangement.
- (9) Stores launching and releasing - GAR, unguided missiles, guided missiles, illuminants, fuel tanks, rescue gear.

- (10) Aircraft non-mission - defogging, defrosting, deicing, windshield wiping, actuation, alighting (shock absorbers, brakes, steering), stabilization, instrumentation, visibility (radomes, transparent areas), flight and power plant cockpit controls, furnishings and luggage, hydraulics, pneumatics, air conditioning, electrical, fuel systems.
- (11) Flight clothing - masks and pressure suits
- (12) Post emergency flight systems - escape, descent, location and communication
- (13) Launching and assist take-off systems

d. Aircraft propulsion systems, including:

- (1) Controls
- (2) Starting
- (3) Injection systems
- (4) Exhaust
- (5) Intakes
- (6) Cooling
- (7) Fuel purging
- (8) Fuel tanks
- (9) Fuel transfer systems

e. Aircraft maintenance and support

3. ARMAMENT DIVISION

Handbook to include the following:

a. Manned aircraft, including:

- (1) Fire control
- (2) Weapons, including psychological and nuclear, fuzes but excluding GAR.
- (3) Weapon selection

b. Unmanned aircraft, including:

- (1) Weapon guidance
- (2) Fire control
- (3) Weapons, including psychological and nuclear, fuzes

c. Support and maintenance of armament

4. TRAINING DIVISION

Handbook(s) to include the following:

- a. All USAF training equipment systems, excluding training aircraft.
- b. Support and maintenance of training equipment.



## 5. COMMUNICATION-NAVIGATION DIVISION

Handbooks to include the following:

a. Communications, including:

- (1) Air-air
- (2) Air-ground
- (3) Ground-ground
- (4) Communication security
- (5) Cryptology

b. Navigation and ground control, including:

- (1) Target identification, location, marking
- (2) Station keeping
- (3) En-route navigation
- (4) Air-air
- (5) Ground-air - self-contained
- (6) Light, radio, D/F
- (7) Landing and traffic control
- (8) Taxi control - alert crew
- (9) Control towers - portable and fixed
- (10) Hazard detection

c. Command review and display of battle

d. Intelligence, including:

- (1) Analysis
- (2) Collation
- (3) Comparison
- (4) Recording
- (5) Collating
- (6) Indexing

e. Anti-aircraft control

f. Intercept control, including:

- (1) Air
- (2) Ground

g. Guidance and control, including:

- (1) Manned aircraft
  - (a) Air-air
  - (b) Ground-air
  - (c) Air-ground
- (2) Unmanned aircraft
  - (a) Air-air
  - (b) Ground-air

- (3) Rescue boats
  - (a) Air-ground
  - (b) Ground-ground

h. Reconnaissance and data recording, including:

- (1) Photographic
- (2) Electronic
- (3) Infra-red
- (4) Visual
- (5) Microfilming
- (6) Photo processing
- (7) Illuminants
- (8) Reproduction
- (9) Data transmission (special)
- (10) Data recording and processing
- (11) Assessment
- (12) Remote sensing and assessment, including geodetic control
- (13) Mapping and charting
- (14) Illuminant launching, release, guidance

i. Identification, detection, and warning, including:

- (1) Airborne
- (2) Ground

j. Support and maintenance of all above equipment

6. MISCELLANEOUS SYSTEM DIVISION

Handbooks to include the following:

a. Administration, including:

- (1) Control
- (2) Communications
- (3) Transportation
- (4) Other facilities and equipment

b. Logistic, including:

- (1) Stock control
- (2) Stock requirement component
- (3) Reordering
- (4) Storing and storage areas
- (5) Packaging and shipping
- (6) Salvaging
- (7) Handling
- (8) Warehouses

c. Ground utilities, including:

- (1) Lighting
- (2) Electric power supply
- (3) Water supply and distribution
- (4) Gas supply and distribution
- (5) Metering
- (6) Gas odorizing
- (7) Sewage disposal
- (8) Heating systems
- (9) Steam power installations
- (10) Water filtering, treatment and softening
- (11) Ventilating and air conditioning
- (12) Refrigeration
- (13) Fire hydrants and reservoirs
- (14) Compressed air

d. Construction, including

- (1) Cleaning
- (2) Grading
- (3) Asphalt and aggregate plants

e. Active defense and security (ground)

f. Passive defense (ground), including:

- (1) Cover and concealment
- (2) Camouflage
- (3) Deception, including decoys, dummies, false targets, false influences
- (4) Spoofing and jamming
- (5) Shelters
- (6) Contamination detection and decontamination
- (7) Communications
- (8) Flood and storm

g. Personnel housing and recreation

h. Food service

i. Airfield facilities, including:

- (1) Runways and launchers
- (2) Runway lighting and marking
- (3) Hangars
- (4) Docks, marine
- (5) Drainage
- (6) Barriers and arresters
- (7) Installation of operations facilities
- (8) Parking and tie-down
- (9) Cargo (air) facilities
- (10) Inter-communications
- (11) Aircraft erection and hoisting facilities

j. Medical, including:

- (1) Air evacuation
- (2) Ground facilities

k. Weather, including:

- (1) Air systems
- (2) Ground systems
- (3) Data transmission and recording (special aspects)

l. Rescue, escape and evasion, including:

- (1) Survival
- (2) Pick-up
- (3) Location and communication
- (4) Re-supply
- (5) Escape and evasion

m. Crash fire and rescue

n. Ground clothing and personal protection

o. Research and development and operational test

p. Aerial delivery system

NOTE: Support and maintenance to be included in each sub-paragraph 6a. through 6p.

## ALLOCATION OF FUNCTIONS WITHIN PLAN "G"

General information concerning systems and common design data.

### Manned Aircraft Airframe

Achieving speed by airframe  
Achieving altitude by airframe  
Carrying parasites  
Aerial towing, coupling  
Aircraft (installed) loading and unloading  
Cargo restraint  
Jettisoning  
Personnel boarding and unloading  
Personnel seating  
Aircraft fire prevention and extinguishing  
Aircraft hazard warning  
Aircraft defogging, defrosting and deicing  
Aircraft windshield wiping  
Aircraft deceleration  
Aircraft engine mounting  
Actuation (airborne)  
Aircraft alighting (including shock absorbing, braking, steering)

Aircraft stabilizing  
Aircraft instrumentation  
Aircraft fuel storage and distribution  
Providing for aircraft visibility (windshields, radomes)  
Flight and power plant control systems  
Airborne purging systems  
Aircraft engine starting  
Aircraft engine anti-detonant injection systems  
Aircraft furnishings - safety and utility  
Aircraft insulating, sound proofing and padding  
Rotary wing aircraft transmission systems

### Unmanned Aircraft Airframe

Achieving speed by airframe  
Achieving altitude by airframe  
Aerial towing, coupling  
Jettisoning  
Ground launched missiles  
Aircraft defogging, defrosting and deicing  
Aircraft deceleration  
Aircraft assist take-off  
Actuation - (airborne)  
Aircraft stabilizing

Aircraft instrumentation  
Aircraft fuel storage and distribution  
Aircraft lubricant storage and distribution  
Flight and power plant control systems  
Aircraft engine starting  
Aircraft insulating, sound proofing and padding

### Installed Systems

Communication, control, signalling  
Air crew escape  
Personnel and air crew protection  
Personnel and air crew services

Aircraft alighting (including shock absorbing, braking, steering)  
Aircraft stabilizing  
Aircraft instrumentation

Carrying parasites  
Evasive action  
Armor  
Airborne weapons, launching, release  
Missile or weapons aiming, guidance  
Aerial towing, coupling  
Camera mounts and stabilizers  
Aircraft (installed) loading and unloading  
Cargo restraint  
Jettisoning  
Personnel boarding and unloading  
Personnel seating  
Aircraft fire prevention  
Aircraft hazard warning  
Aircraft defogging, defrosting and deicing  
Aircraft windshield wiping  
Aircraft deceleration  
Aircraft assist take-off  
Aircraft engine mounting  
Actuation - (airborne)

Aircraft fuel storage and distribution  
Aircraft lubricant storage and distribution  
Providing for aircraft visibility (windshields, radomes)  
Flight and power plant control systems  
Airborne purging systems  
Aircraft engine starting  
Aircraft engine anti-detonant injection systems  
Aircraft engine exhaust systems  
Aircraft engine air intake systems  
Aircraft furnishings - safety and utility  
Aircraft insulating, sound proofing and padding  
Rotary wing aircraft transmission systems

#### Aircraft Propulsion Systems

Achieving speed by propulsion  
Achieving altitude by propulsion  
Aircraft engine mounting  
Aircraft propulsion  
Flight and power plant control systems  
Aircraft engine starting

Aircraft engine anti-detonant injection systems  
Aircraft engine exhaust systems  
Aircraft engine air intake systems  
Rotary wing aircraft transmission systems

#### Aircraft Maintenance and Support

Towing - hauling  
Hoisting  
Refueling  
Spraying  
Jack manifolding  
Lubricating  
Gas compressing  
Gas and liquified gas generating  
Flushing and cleaning  
Conveying - gravity and power  
Ventilating and blowing  
Aircraft material lifting  
Aircraft material hauling

Gas storing and transferring  
Liquified gas storing and transferring  
Blast deflecting  
Protective shielding  
Portable lighting  
Aircraft protective screening  
Electrical generating - auxiliary  
Electrical distributing - auxiliary  
Electrical testing and maintaining  
Testing, measuring and calibrating  
Covering and protecting  
Ducting  
Aircraft pneumatic lifting

Air conditioning, heating,  
cooling and dehumidifying  
Parachute repairing  
Slinging and spreading  
Charging and converting  
Fluid segregating  
Tool using  
Air heating  
Aircraft towing  
Aircraft blocking and mooring  
Climbing (ladders)  
Slinging (aircraft engines)  
Sheltering and housing (stands,  
shelter)  
Liquid storing and transferring

Personnel and air crew food  
Shop tools  
Hangars  
Portable shelters  
Decontamination  
Crash fire crash rescue  
Marine docks  
Aircraft weighing  
Contamination detection -  
decontamination  
Aircraft engine starting  
Launching and catapulting  
Arresting

#### Armament Division

Airborne guns  
Air launched missiles  
Fire control  
Armor  
Weapons, nuclear  
Weapons, HE  
Weapons, PW  
Weapons, CW

Weapons, psychological warfare  
Weapons, anti-naval  
Airborne weapons, launching, release  
Missile or weapons aiming, guidance  
Illuminant launching or release  
Ground guns  
Ground launched missiles

Including maintenance of these items

#### Training Division

All forms of training equipment, including maintenance of these items.

Training

#### Communications, Navigation Division

Communication, control, signalling  
Air and ground based navigation,  
command control  
Emergency communications and location  
Deception, false targets influences  
Surprise  
Defensive countermeasures  
Spoofing and jamming  
Fire control  
Evasive action  
Missile or weapons aiming, guidance

Electronic reconnaissance data  
gathering and recording  
Assistance for gathering visual  
reconnaissance data  
Aerial cameras and components  
Camera mounts and stabilizers  
Photo processing ground and air  
Radar, television, fax and data  
transmission and recording  
Photo analysis and interpretation  
Photo reproduction

Target location, identification and marking  
Airborne identification, detection, warning  
Communications security  
Landing and traffic control  
Station keeping  
Weapon selection  
Assessment of results - data gathering

Illumination - air photographic  
Aeronautical chart data gathering  
Geodetic control  
Ground based identification, detection, warning  
Data relay  
Long range collection  
Target seekers  
Ground observer detection ranging and tracking

Including maintenance of these items.

#### Administration

Communication, control, signalling  
Air and ground based navigation, command control  
Administration  
Communications security  
Weapon selection  
Assessment of results - data gathering  
Assessment of results - data analysis  
Electronic reconnaissance data gathering and recording  
Electronic reconnaissance analysis  
Weather reconnaissance data gathering and recording  
Weather data analysis  
Assistance for gathering visual reconnaissance data

Visual reconnaissance data recording  
Radar, television, fax and data transmission and recording  
Photo analysis and interpretation  
Aeronautical chart data gathering  
Photogrammetric analysis and compilation  
Data relay  
Aeronautical chart reproduction  
Ground observer detection ranging and tracking  
Command review and display of battle information  
Intelligence analysis, collation and comparison  
Recording, collating, indexing  
Cryptology

Including maintenance of these items.

#### Logistic

Materials handling  
Ground cargo handling, loading and unloading  
Stock controlling  
Stock requirement computing

Storing  
Transporting (except air)  
Salvaging (baling, electro-magnetic hoists)  
Packaging

Including maintenance of these items.



Ground Utilities

Lighting and electric power supply  
and distribution except auxiliary  
Water supply and distribution  
Gas supply and distribution  
Erection and hoisting  
Structural fire fighting  
Utility metering  
Natural gas odorizing  
Liquid storage and distribution  
Sewage disposal  
Steam power installations  
Compressed air installations

Water softening except aircraft  
servicing  
Marine docks  
Air conditioning and ventilating,  
except servicing  
Refrigeration  
Heating, except servicing  
Drainage  
Contamination detection -  
decontamination  
Launching and catapulting  
Arresting

Including maintenance of these items.

Construction

Air raid warning and shelters  
Clearing, grading, surfacing roads,  
hardstands, runways  
Erection and hoisting

Drainage  
Permanent shelter and housing  
Installation (base, building)

Including maintenance of these items.

Active Defense

Defensive countermeasures  
Active defense

Including maintenance of these items.

Passive Defense

Deception, false targets influences  
Surprise  
Spoofing and jamming

Evasive action  
Camouflage  
Armor

Including maintenance of these items.

Personnel Housing and Recreation

Permanent shelter and housing

Including maintenance of this item.

### Food Service

Personnel and air crew food

Including maintenance.

### Airfield Facilities

Aircraft towing  
Sheltering and housing (stands, and shelter)  
Liquid storing and transferring  
Gas storing and transferring  
Liquid gas storing and transferring  
Portable lighting  
Communication, control, signalling  
Air and ground based navigation, command control  
Weather data metering and recording (ground)  
Emergency communications and location

Landing and traffic control  
Control towers  
Shop tools  
Airfield lighting and marking  
Hangars  
Portable shelters  
Air raid warning and shelters  
Decontamination  
Crash fire crash rescue  
Liquid storage and distribution  
Marine docks  
Contamination detection - decontamination

Including maintenance of these items.

### Medical

Medical  
Air evacuation (medical)

Including maintenance of these items.

### Weather

Weather data gathering and recording (ground)  
Weather reconnaissance data gathering and recording

Weather data analysis  
Wind direction indicating

Including maintenance of these items.

### Rescue, Escape and Evasion

Survival kits, boats, rafts, parachutes  
Evasion and escape  
Air crew escape

Crash marking (land and water)  
Rescue pick-up  
Message and equipment pick-up

### Crash Fire and Rescue

Crash fire crash rescue  
Crash marking (land and water)

Including maintenance of these items.

### Ground Clothing and Personal Protection

Personnel and air crew clothing,  
including G-suits  
Personnel and air crew protection

Personnel and air crew services  
Air raid warning and shelters  
Personal luggage

Including maintenance of these items.

### R & D and Operational Test

Research, development and operational testing (special equipment and facilities).

Including maintenance of this item.

### Aerial Delivery

Aerial resupply  
Target location, identification  
and marking  
Cargo restraint

Material handling  
Transporting  
Packaging

## APPENDIX V

### ANALYSIS OF PRELIMINARY PLANS

Plans "A" through "G" described in Appendix IV were analyzed individually on the basis of the criteria listed in the technical report. The results of the analyses were tabulated for comparison purposes as shown in Table III of the technical report.

#### ANALYSIS OF PRELIMINARY PLAN "A"

##### Direct Industrial Classification (Plan A)

1. This plan is based on the "Standard Industrial Classification Manual," Vol. I, Manufacturing Industries, November 1945, prepared by the Federal Bureau of the Budget.
2. The individual items in the "List of USAF Functions" were allocated among the following proposed handbook areas:
  - a. Aircraft and Parts
  - b. Motor Vehicles and Motor Vehicle Equipment
  - c. Electrical Machinery, Equipment and Supplies
  - d. Ordnance and Accessories
  - e. Machinery (except Electrical)
  - f. Fabricated Metal Products (except Ordnance, Machinery and Transportation Equipment)
  - g. Controlling and Test Instruments and Assemblies, and Photographic Equipment and Supplies
  - h. Unclassified (see paragraph 3)
3. It should be noted that the organization as indicated above is, at this point in the study, a preliminary organization only; designed to test its adequacy as an organizational medium. For this reason a number of items from the "List of USAF Functions" are shown as "Unclassified." These items can be classified, or additional categories can be created for them if this direct "Industrial Classification" organization is selected as the most desirable.
4. The following comments are related to the manner in which Plan "A" meets the "Criteria for Handbook Plan Evaluation:"
  - a. All-inclusiveness - in general this plan provides for comprehensive coverage. Because the Standard Industrial Classification was designed to include all U. S. manufacturing industry, and because all of the equipment now required, or to be required by the Air Force, will be provided by some segment of U. S. industry, the plan inherently provides a place for every item.

- b. Minimum Repetition of Material - this is also inherent in the plan. Because equipment is associated with the industry producing it, and because the standard industrial classification is essentially non-repetitive with respect to industry, this plan does provide non-repetitive treatment of the subject matter.
- c. Maximum Guidance in Minimum Number of Handbooks - in general, it can be stated that the material required by a contractor will be found in the handbook pertaining to his industrial field. The prime contractor for a weapon system, will, of course, (as in the case of any of the plans presented herein) require the complete or nearly complete handbook series. There are, however, some deficiencies in this regard. Information on celestial navigation equipment would be in the "Instruments and Photographic Equipment Handbook," information on electronic navigation equipment in the "Electrical Handbook." (See also paragraph 4c(1) of Plan "F".)
- d. Self-Evident Content - this requirement is not met by Plan "A".
  - (1) A designer who is seeking information regarding equipment for seating personnel would find such information in the "Fabricated Metal Products Handbook." However, with an advance of the state of the art, the same equipment might very well be fabricated of material other than metal, after the handbook organization had been fixed; in which event personnel seating equipment might belong in an entirely different handbook.
  - (2) From the standpoint of the writer of the handbook, there is no clear cut definition of scope. He will know, for example, that in writing the handbook on electrical machinery, equipment and supplies, he must give full treatment to communications radio equipment. But how far shall he go into the design of the test equipment therefor? How much coverage of test oscillators will be in the volume on "Instruments and Photographic Equipment"?
- e. Handbooks Independent of Factors which Change - the standard industrial classification, upon which this plan is predicated, is not particularly subject to violent or frequent change. It should be noted, however, that in order to allocate items contained in the "List of USAF Functions" among the various handbooks of the series, it is necessary to determine the specific nature of the equipment in terms of the current state of the art. This is a most serious deficiency of Plan "A".
- f. Number of Handbooks - the number of handbooks under this plan appears to be reasonably small.
- g. Homogeneous Content - this plan does not provide uniformity of content within a handbook. While each handbook is devoted to an industrial field, there is a wide variety of equipment in each.

For example, the electrical machinery handbook would contain information on such dissimilar items as: ground electrical units for servicing aircraft, communications radio, X-ray machinery, airborne public address equipment, panoramic radio receivers, ground radar equipment, airfield lighting equipment. The ordnance handbook would contain information concerning such dissimilar items as: ejection seats, machine guns, fire control systems, smoke bombs. The machinery (except electrical) handbook would contain information concerning such dissimilar items as: material handling equipment, computers, reproduction equipment, paving and earth-moving equipment, public utility type equipment.

- h. Insertion of New Material - the determination of the proper handbook into which to insert new material as the state of the art progresses would be complicated by the same factors as discussed in paragraph e. above. It would be necessary to predetermine the nature of this equipment for proper allocation.
- i. Reasonable Distribution System - this plan appears adaptable to a reasonable distribution system in that a handbook would, in most cases, contain sufficient guidance for the designer of a product. In appropriate circumstances, only the pertinent parts of handbooks would need to be furnished. The designer of a weapon system would require the entire handbook series.
- j. System, Sub-System, Component, etc., Coverage - various levels of system coverage can be obtained by general paragraphs in each chapter, general chapters in each volume, and a general volume.

#### ANALYSIS OF PRELIMINARY PLAN "B"

##### Weapon System Organisation (Plan B)

- 1. This plan is suggested by the Weapon System Concept.
- 2. The items appearing in the "List of USAF Functions" were allocated among the following proposed handbook areas:
  - a. Aircraft and Guided Missiles
  - b. Airborne Equipment
  - c. Weapon System Ground Support Equipment
  - d. Air Base Equipment
  - e. Unclassified
- 3. It should be noted that the content of areas "c" and "d" above is determined by the extent of the prime contractors' responsibility under his contract for the development of a weapon system.

4. The following comments are related to the manner in which Plan "B" meets the "Criteria for Handbook Plan Evaluation:"

- a. All-inclusiveness - the structure of this plan is basically a comprehensive one, for it divides equipment into air and ground, in the first instance, and, in the second instance, divides all ground equipment into one category which is the responsibility of the prime contractor, and another category, which includes all remaining equipment not the responsibility of the prime contractor. Thus, all types of equipment are provided for.
- b. Minimum Repetition of Material - this plan is essentially non-repetitive.
- c. Maximum Guidance in Minimum Number of Handbooks - because of the nature of the definitions for the Ground Support and the Air Base Handbooks, there is no clear cut or permanent delineation of their content. Equipment which is not the responsibility of the prime contractor for a weapon system under certain conditions might well be the responsibility of the prime contractor in another instance. Furthermore, separating airborne accessory equipment from ground equipment itself introduces complications. While different in certain respects, airborne photographic, airborne communications equipment, airborne radar equipment, all have great areas of similarity to ground equipment of the corresponding types from the designer's standpoint. For these reasons it would be difficult to predetermine whether the Airborne Equipment, the Ground Support Equipment, or the Air Base Equipment Handbook, or a combination, or all three were necessary for a particular designer.
- d. Self-Evident Content - for the reasons cited in paragraph "c" above, there is ambiguity in the scope of the various handbooks under Plan "B". A rocket launcher could be so intimately connected to the characteristics of a missile that it would be the responsibility of the prime contractor; therefore belong in the Ground Support Handbook. Under other conditions, however, (after a standardization of launchers, for example) the launcher might be an item of Air Base Equipment under the definition of scope for that handbook. Under this plan some of the design guidance information concerning photographic developing equipment would be in the Airborne Equipment Handbook, and some guidance on photographic developing equipment would be in the Air Base Handbook. It would not be possible to determine from the handbook titles which information would be in which handbook. The same ambiguity would exist in the case of many other types of equipment.
- e. Handbooks Independent of Factors which might Change - this plan, based upon the weapon system concept, divides all ground equipment into two handbooks: One (Ground Support) containing information corresponding to the prime contractor's responsibility; the other (Air Base) containing all remaining ground equipment. Since the scope of responsibility of the prime contractor will assuredly

change with time, it must be concluded that the organization of this plan is not independent of factors which might change.

(1) Examples:

- (a) A crash fire truck might now be base equipment (not the prime contractor's responsibility). With widespread use of hypergolic fuels, the design requirements for a crash fire truck might be so altered as to require that it be included in the Ground Support Handbook as a responsibility of the prime contractor.
- (b) Rocket launchers might be Ground Support items now and Air Base items later (see paragraph 4c).
- (c) A fuel servicing vehicle is an additional example of a relatively recent change of this sort. Formerly these items were more or less standardized and would have been Air Base Handbook items. With the advent of larger aircraft, such as the B-36, the hydrant refueling system became necessary. This, in its first development, would be in the nature of "Ground Support Equipment," inasmuch as it would have been the prime contractor's responsibility had the B-36 been developed under the weapon system concept. Later, as a standard item, hydrant refueling systems would again belong in the Air Base Equipment Handbook.

- f. Number of Handbooks - the number of handbooks under this plan appears to be reasonably small.
- g. Homogeneous Content - except for the Aircraft and Guided Missiles Handbook, the scope of the handbooks based on Plan "B" is heterogeneous. The Ground Support Equipment Handbook, for example, provides coverage over such a diverse field as: aircraft lifting jacks; hydraulic test sets; missile launchers (at present); testers for airborne fire control equipment; test gear for airborne communications, radar and photographic equipment; aircraft ground towing equipment; special ground guidance and navigation equipment; fuel servicing vehicles; and portable maintenance stands, and shelters. The Air Base Handbook will provide information concerning such dissimilar equipment as: radio communication equipment, material handling equipment, medical equipment, photographic processing equipment, shop tools, hangars, water supply equipment and runway maintenance equipment.
- h. Insertion of New Material - the determination of the proper handbook into which to insert new material as the state of the art progresses appears to be comparatively simple.
- i. Reasonable Distribution System - this plan appears to be adaptable to a reasonable distribution system.
- j. System, Sub-System, Component, etc., Coverage - various levels of system coverage can be obtained by general information paragraphs, chapters, volumes, and/or handbooks.



## ANALYSIS OF PRELIMINARY PLAN "C"

### Functional Organization (Plan C)

1. This plan is based on a first level grouping into functional areas of the items contained in the "List of USAF Functions." These first level groups are functional areas and suggest the scope of corresponding handbooks. Each handbook is divided (second level) into a general volume (or part) and succeeding volumes (or parts) as appropriate, in which equipment is allocated according to the "Standard Industrial Classification Manual," "Volume I, Manufacturing Industries, November 1945, prepared by the Federal Bureau of the Budget.

2. The individual items in the "List of USAF Functions" were allocated among the following proposed handbook areas:

- a. Aircraft and Pilotless Aircraft and Guided Aircraft Rockets
- b. Air and Ground Support
- c. Communications, Control, Signalling and Navigation
- d. Supply and Administration
- e. Medical, Meteorological, Chemical and Others
- f. Training
- g. Armament
- h. Photographic
- i. Base Systems (engineering and utilities)

3. The following comments are related to the manner in which Plan "C" meets the "Criteria for Handbook Plan Evaluation:"

- a. All-inclusiveness - basically this plan provides for comprehensive coverage, for all of the items in the "List of USAF Functions" are, or can be, allocated in one or another of the handbooks.
- b. Minimum Repetition of Material - this plan provides for non-repetitive treatment of material. While industrial classification groups covering identically titled industrial areas will exist in several of the handbooks, specific equipment will appear in only one part of one handbook.
- c. Maximum Guidance in Minimum Number of Handbooks - this plan consists of nine handbooks, but an equipment designer would be able to obtain all the pertinent design guidance concerning a particular item from one general section of one handbook, plus one industrial classification section of that handbook. All the design guidance information concerning all the types of equipment normally manufactured in a particular establishment would be similarly obtainable, except in cases where a single establishment manufactures two more more types of equipment of an essentially different character. In the latter case, reference would have to be made to the general section and industrial classification sections for each equipment if these equipments did not fall within one functional area; or to different industrial classification sections and the same general section if the equipment were located within the same functional area.

- d. Self-Evident Content - with the exception of "Supply and Administration," "and other" in "Medical, Meteorological, Chemical, and other," and "Base Systems," the contents of the various handbooks are self-evident. The above mentioned tentative titles could be changed to provide better definition.
- e. Handbooks Independent of Factors which might Change - although there is always a possibility that functional areas may be altered for reasons not at present readily apparent, at this time it would appear that such areas will be applicable for a number of years. These functional areas are not affected by changes in the state of the art, which do affect the types of equipment and result in new components, or new uses for components previously used in different applications.
- f. Number of Handbooks - the nine handbooks of this plan do not constitute an unreasonable number. It is possible to reduce the number by combining several of the minor functional areas in one handbook.
- g. Homogeneous Content - the contents of each handbook are functionally homogeneous in general and at the second level are industrially homogeneous.
- h. Insertion of New material - new material may be added at any level.
- i. Reasonable Distribution System - this plan would be adaptable to a reasonable system of distribution.
- j. System, Sub-System, Component, etc., Coverage - this plan can provide system, component, etc., design guidance information without undue duplication and without undue decentralization.

#### ANALYSIS OF PRELIMINARY PLAN "D"

##### ASTIA Distribution Guide Organization (Plan D)

1. This plan is suggested by the classification used for organizing documents by the Armed Services Technical Information Agency (ASTIA) as published in that agency's distribution guide, 1 February 1953.

2. The individual items in the "List of USAF Functions" were allocated among the following proposed handbook areas:

- a. Aircraft and Flight Equipment
- b. Communications Equipment
- c. Detection Equipment
- d. Electrical Equipment

- e. Ground Transportation Equipment
- f. Guided Missiles
- g. Engineering Equipment
- h. Photographic and Reproduction Equipment
- i. Propulsion Systems
- j. Quartermaster Type Equipment
- k. Research Equipment
- l. Ordnance Equipment
- m. Medical Equipment
- n. Weather Equipment

These separate parts, together with a common "General Volume" constitute the handbook plan.

3. In the first draft, there were more items from the "List of USAF Functions" not classified under this plan than under any of the others. However, it is felt that if this plan were selected as the most desirable, no great difficulty would be encountered in classifying, or creating additional classifications if necessary.

4. The following comments are related to the manner in which Plan "D" meets the "Criteria for Handbook Plan Evaluation:"

- a. All-inclusiveness - basically this plan provides for comprehensive coverage. (see par 3 above)
- b. Minimum Repetition of Material - this plan provides for non-repetitive coverage of material.
- c. Maximum Guidance in Minimum Number of Handbooks - an equipment designer would be able to obtain the pertinent design guidance concerning a particular item in one handbook together with the common "General Volume."
- d. Self-Evident Content - titles of handbooks indicate contents.
- e. Handbooks Independent of Factors which might Change - this type of breakdown is based on the functional grouping system and is, therefore, independent of changes in types or forms of equipment.
- f. Number of Handbooks - the number of handbooks appears to be beyond a "reasonable" limit, particularly since additional ones might be necessary for the "Unclassified" functions. This could be taken care of by combining certain handbooks, although the total quantity of material would have to remain the same. There would seem to be no great advantage to be gained by combining two and three similar titles in one handbook if the quantity of material required the combined handbook to be published in two or more separate volumes.
- g. Homogeneous Content - the contents of each handbook would be homogeneous from the functional standpoint.
- h. Insertion of New Material - insertion of new material (such as types or forms of equipment not included in the original conception)

would be comparatively simple. Its location would be based on its functional use or purpose.

- i. Reasonable Distribution System - this plan would be adaptable to a reasonable system of distribution.
- j. System, Sub-System, Component, etc., Coverage - this plan can provide system, component, etc., design guidance information without undue duplication or decentralization.

### ANALYSIS OF PRELIMINARY PLAN "E"

#### ARDC Manual 80-4 Organization (Plan E)

1. This plan was suggested by the Handbook Branch, WCXII, and is based on the technical groupings described in par 2, chapter 2 of ARDC Manual 80-4, 1 December 1952.

2. The individual items in the "List of USAF Functions" were allocated among the following proposed handbook areas:

- a. Missile
- b. Aircraft
- c. Ground Support for Airborne Instrument Equipment
- d. Ground Support for Ground Instrument and Equipment
- e. Base Equipment and Its Support
- f. Guidance and Control Equipment
- g. Navigation Equipment
- h. Electronics Equipment
- i. Communications Equipment
- j. Propulsion and Fuels
- k. Armament Equipment
- l. Flight Operation and Control Equipment
- m. Reconnaissance Equipment
- n. Photographic Equipment
- o. Airborne Instruments
- p. Active Supporting Systems
- q. Passive Supporting Systems
- r. Transportation, Storage and Packaging
- s. Training Equipment and Aids
- t. Environmental Equipment

3. In addition, other handbook areas dealing with abstract ideas are indicated in the first draft. These, it appears, could be combined together with other subject matter into a general handbook.

It is recognized that Plan "E", as it exists, is in preliminary form, and that refinements would have to be made if this plan were selected as the most suitable.

4. The following comments are related to the manner in which Plan "E" meets the "Criteria for Handbook Plan Evaluation:"

- a. All-inclusiveness - this plan provides for comprehensive coverage.
- b. Minimum Repetition of Material - in its present (preliminary) form, this plan would result in considerable duplication.
  - (1) For example: The Ground Support for Airborne Instrument Handbook would include such items as test equipment for airborne communications sets. This might be covered also in the Communications Handbook. The Ground Instrument Support Handbook would include such items as electric power units for ground radar - similar material would also be included in the Airborne Instrument Support Handbook and in the Communications and Base Equipment Handbooks. Decontamination and contamination detection equipment might be covered under "Base Equipment" as well as "Passive Defense."
- c. Maximum Guidance in Minimum Number of Handbooks - because of the decentralization of information, it would appear that a designer would frequently not find full information on a given subject in one or two handbooks.
- d. Self-Evident Content - in its present (preliminary) form, there is a lack of definition in the titles. Active supporting systems and passive supporting systems are not particularly clear. The repetitive nature of coverage (see par b) further results in uncertainty as to the actual content of a handbook as suggested by its title.
- e. Handbooks Independent of Factors which might Change - this plan is based on factors which are reasonably stable.
- f. Number of Handbooks - this plan results in the greatest number of separate handbooks. This total (20) could be reduced by reworking the organization.
- g. Homogeneous Content - this plan would result in reasonably homogeneous material in each handbook.
- h. Insertion of New Material - insertion of new material should be easy under this plan.
- i. Reasonable Distribution System - for the reasons outlined in par (b) it would be costly to distribute handbooks based on Plan "E".
- j. System, Sub-System, Component, etc., Coverage - in its present (preliminary) form, Plan "E" would not provide system, sub-system, component, etc., information without undue duplication or decentralization. "Guidance and Control," "Navigation," "Electronics,"

"Communications," and "Flight Operation and Control" would require a common area in the "General" Handbook, but this information would be of no interest to designers of much of the other USAF equipment who would receive the "General" Handbook. These five handbooks would logically require a separate general handbook, or alternatively, the general information would need to be repeated in the individual handbooks. There is provision for "Airborne Instrument Support," and an additional two handbooks cover "Ground Instrument Support" and "Base Equipment and Its Support." Some of the items will need to be duplicated in each of these three handbooks, yet no single handbook will serve as a centralized source of support type of equipment.

### ANALYSIS OF PRELIMINARY PLAN "F"

#### Air Personnel and Ground Organization (Plan F)

1. This handbook plan was proposed by the Handbook Branch WCXH, and is divided as follows:

- a. At the first level into one handbook for manned aircraft, and one for unmanned aircraft and one for ground bases. These three handbooks contain design information for manned and unmanned airframes and also appropriate information regarding the installation of sub-systems in the airframe or ground base.
- b. At the second level there are three or more handbooks (one for air and one for personnel, added at this level and not connected with the first level, and one or more for ground). These handbooks will contain, within their respective areas, information regarding the characteristics of sub-systems.
- c. At the third level equipment design guidance will be presented in separate handbooks (volumes) patterned after the Standard Industrial Classification Manual, Volume I, Manufacturing Industries, published by the Federal Bureau of the Budget, November 1945.

2. The individual items in the "List of USAF Functions" were allocated among the following proposed handbook areas:

- a. Manned Airframe
- b. Unmanned Airframe
- c. Ordnance and Accessories
- d. Apparel and Accessories
- e. Fabricated Metal Products
- f. Machinery (except electrical)
- g. Electrical Machinery

- h. Transportation Equipment
- i. Instruments, Photographic and Optical Equipment
- j. Non-metallic Fabricated Products

3. Since all equipment design information under Plan "F" will be contained in the handbooks listed in par 2 above, only these handbooks will be considered in the following paragraphs to determine the adequacy of Plan "F". The other handbooks referenced in par 1a are in the nature of a "Superstructure," which, itself, could be included in any of the other plans; and which will be the subject of further study, after determination of the most suitable plan for categorizing the basic equipment design information.

4. The following comments relate to the manner in which Plan "F" meets the "Criteria for Handbook Plan Evaluation:"

- a. All-inclusiveness - in general this plan provides for comprehensive coverage.
- b. Minimum Repetition of Material - this plan is basically non-repetitive. Components, which are common to equipments within a handbook can be covered in a general chapter or volume of that handbook. Those which are common to equipments in different handbooks can be covered in one or more "General" handbooks.
- c. Maximum Guidance in Minimum Number of Handbooks - because variations in the design of equipment can result in the inclusion of that equipment in more than one industrial classification, a designer would not know in which industrial handbook to find design information concerning a product.

(1) For example:

- (a) Aircraft wheel chocks, ladders, office furniture, portable liquid storage tanks might be in the fabricated metal products or the non-metallic fabricated products.
- (b) Space heaters might be in the fabricated metal products or in the electrical handbook.
- (c) A recovery system for missiles might be included in the non-metallic fabricated products handbook if it were a parachute device, or in the transportation handbook if it were a rocket or similar device.
- (d) In addition to information relating to cameras, the camera designer (instruments, photographic and optical equipment) for example, also needs to have film data, and film container information; he requires guidance concerning sizes and capacities of laboratory tanks (fabricated metal products, or non-metallic fabricated products), drying equipment characteristics (machinery, except electrical); he requires information concerning camera mounts (machinery, except electrical or fabricated metal products.)
- (e) A designer of a portable liquid storage tank (fabricated metal or non-metallic fabricated products) will need information concerning the capacity of pumping equipment

(machinery, except electrical) and the characteristics of pipes and tubing (fabricated metal products).  
(f) (See also par 4c of Plan "A".)

- d. Self-Evident Content - the same disadvantages quoted above in par c and those referred to in Plan "A", par 4d apply to this plan. The content of a particular handbook is not always self-evident.
- e. Handbooks Independent of Factors which might Change - the industrial classification requires that each item of equipment be associated with the particular industry which manufactures this type of equipment. The handbooks must be prepared using the existing state of the art for the initial allocation of each type of equipment. Because the state of the art is not stable, it is highly probable that many items of equipment will change in form or nature at some time in the future, and may therefore be manufactured in an entirely different industry.
  - (1) It is not inconceivable that future forms of personnel and equipment parachutes intended for use from extremely high altitudes might take an entirely new form.
  - (2) Aircraft and missiles may be powered by propulsion systems of an atomic nature which will require support equipment entirely different from that now in use. Refueling might require the use of heavy new type vehicles to haul fuel. Alternatively, a refueling of aircraft in the future might require only a pea-sized pellet that could be easily transported to and inserted in the aircraft.
  - (3) Air conditioning equipment of the future might involve charging aircraft with expendable refrigerants in low heat content state, which would act through only the expansion half of the refrigeration cycle, or an endothermic chemical reaction to achieve cooling.
- f. Number of Handbooks - this plan provides for ten handbooks, plus any general handbooks concerned with common items, system and sub-system guidance, etc.
- g. Homogeneous Content - from the industrial classification standpoint, the handbooks are homogeneous. However, for the reasons cited in par 4g, Plan "A", the user will find a great deal of non-pertinent information in any handbook.
- h. Insertion of New Material - difficulty would be experienced in some cases in determining the appropriate industrial classification of a new item of equipment. (See par 4h, Plan "A".)
- i. Reasonable Distribution System - Plan "F" should be compatible with whatever distribution plan is adopted.
- j. System, Sub-System, Component, etc., Coverage - Plan "F" would be compatible with whatever plan is adopted for presenting system, sub-system, etc., information.



## ANALYSIS OF PRELIMINARY PLAN "G"

### Systems Organization (Plan "G")

1. This handbook plan was proposed by the Handbook Branch, WCXH, and is based on a first level grouping into systems areas, and later grouping these areas into distinct divisions as under:

- a. Sustained Flight Division
  - (1) Manned Aircraft
  - (2) Unmanned Aircraft
  - (3) Minor Installed Systems
  - (4) Propulsion
  - (5) Maintenance and Support (aircraft)
- b. Armament Division
- c. Training Division
- d. Communication and Navigation Division
- e. Miscellaneous System Division
  - (1) Active Defense
  - (2) Passive Defense
  - (3) Personnel Housing and Recreation
  - (4) Airfield Facilities
  - (5) Ground Utilities
  - (6) Construction
  - (7) Crash Fire and Rescue
  - (8) Logistics
  - (9) Food Service
  - (10) Administration
  - (11) Ground Clothing and Personal Protection
  - (12) Rescue, Escape and Evasion
  - (13) Aerial Delivery
  - (14) Research and Development and Operational Test
  - (15) Medical
  - (16) Weather

2. The following comments are related to the manner in which Plan "G" meets the "Criteria for Handbook Plan Evaluation:"

- a. All-inclusiveness - area of technical responsibility can be fully covered.
- b. Minimum Repetition of Material - same material will not be repeated under this plan.
- c. Maximum Guidance in Minimum Number of Handbooks - this plan involves a necessity for searching for information which may be included in

several different handbooks. For example, to cover all aspects of transportation it is necessary to obtain information from a(5), b, c, d, e(1), e(4), through e(10), e(12), e(15), and e(16), in addition to information provided in the General Handbook. To cover such items as shelters it would be necessary to follow substantially the same procedure.

- d. Self-Evident Content - large number of handbooks makes it possible to separate the systems, but equipment included in the various systems is not necessarily suggested.
- e. Handbooks Independent of Factors which might be Changed - Systems arrangement appears to have long-term validity.
- f. Number of Handbooks - as considered for this analysis, the plan consists of twenty-four (24) handbooks. This number might be reduced by combining some handbook areas, but this might then tend to further confuse the feature of self-evident content and homogeneity.
- g. Homogeneous Content - from the systems standpoint the material is homogeneous, but from the point of view of a manufacturer of any particular class of equipment, the material is definitely not homogeneous. For instance, the Weather Handbook may contain guidance concerning the special requirements of weather systems regarding trailers, equipment shelter, communication equipment, heating equipment, as well as the specific information concerning meteorological devices and equipment.
- h. Insertion of New Material - no difficulty is presented in adding new items.
- i. Reasonable Distribution System - this plan would require that a manufacturer of a particular class of equipment would require copies of every handbook that contained application information concerning his class of product. Thus initial cost of distribution and subsequent user maintenance would be high.
- j. System, Sub-System, Component, etc., Coverage - no problem anticipated.

## APPENDIX VI

### MASTER PLAN FOR DESIGN HANDBOOKS

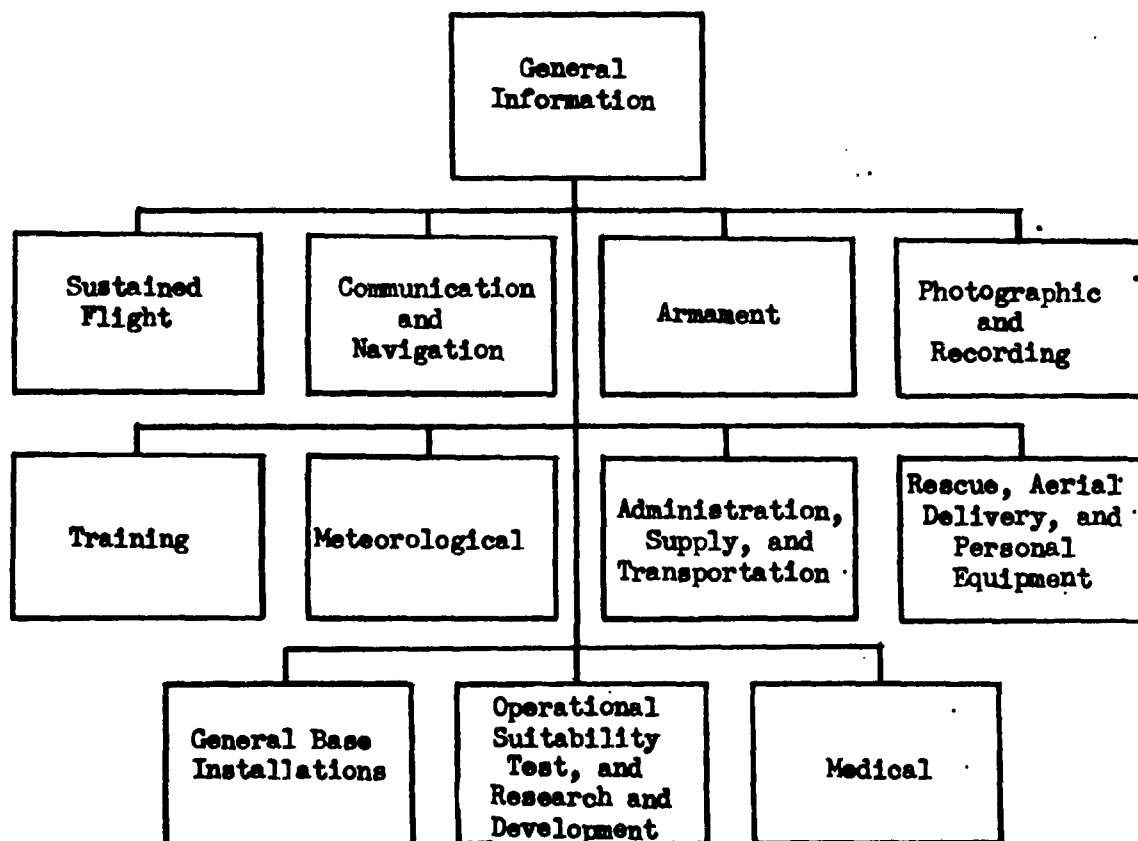
The following pages outline the master plan of technical areas into which handbooks of instructions for equipment designers could logically be divided.

The "General Information Area" is an adjunct to each other handbook. Peculiar support and maintenance equipment is included in the same technical area as the equipment to which it pertains.

Common shop tools and equipment for support and maintenance are in the "Administration, Supply and Transportation Technical Area."

Peculiar requirements for equipment primarily assigned in one technical area will be given in other technical areas as applicable, e.g. The "Armament Technical Area" and the "Meteorological Technical Area" will include peculiar requirements for radar equipment which is covered basically in the "Communication and Navigation Technical Area."

#### ORGANIZATION OF THE MASTER PLAN



### GENERAL INFORMATION AREA

General information concerning systems, overall design procedures and considerations, and information concerning components which are common to two or more of the handbooks.

- A. General information concerning the weapon system concept.
- B. General information concerning systems at a higher level than discussed in the individual handbooks.
- C. General design procedures.
- D. General design considerations:

- Structural Factors
- Production Factors
- Use Factors
- Maintenance Factors
- Human Engineering
- Mobility
- Transportability
- Storage and Warehousing
- Environment

- E. Components and parts.

### SUSTAINED FLIGHT TECHNICAL AREA

This area consists of the following handbooks:

- 1. Handbook of Instructions for Aircraft Designers.
- 2. Handbook of Instructions for Designers of Pilotless Aircraft and Guided Aircraft Rockets.
- 3. Handbook of Instructions for Propulsion Equipment Designers.
- 4. Handbook of Instructions for Aircraft Support Equipment Designers.

## HANDBOOK OF INSTRUCTIONS FOR AIRCRAFT DESIGNERS

Design guidance for airframes of piloted aircraft; relationship to the airframe of Group "A"\* and Group "B"\* systems and equipment used in aircraft; design guidance for Group "A" systems, such as are indicated in the list below.

The design guidance for other equipment used in aircraft is contained in:

Handbook of Instructions for Propulsion Equipment Designers

Armament Technical Area

Communication and Navigation Technical Area

Photographic and Recording Technical Area

Rescue, Aerial Delivery and Personal Equipment Technical Area

Administration, Supply and transportation Technical Area

Medical Technical Area

Meteorological Technical Area

Handbook of Instructions for Aircraft Support Equipment Designers

Air crew escape

Air crew and passenger services (including oxygen, pressure, air conditioning, and relief)

Flight (manned aircraft, including gliders) (airframe design)

Achieving speed (by airframe)

Achieving altitude (by airframe)

Carrying parasites

Evasive action

Protection (armor)

Aerial towing, coupling

Aircraft loading and unloading (installed)

Cargo restraint

Jettisoning

Personnel seating

Aircraft fire prevention and extinguishing

Aircraft hazard warning

Actuation - (airborne) (including electric, pneumatic, hydraulic, explosive and mechanical systems)

Aircraft alighting (including shock absorbing, braking, steering)

Aircraft stabilizing

Aircraft instrumentation

Providing for aircraft visibility (windshields, radomes)

Flight control (systems and equipment)

Aircraft furnishings (safety and utility)

Aircraft insulating, sound proofing and padding

∅ Launching and catapulting

∅ Arresting

Carrying and release of external stores

Aircraft auxiliary powering

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\* Group "A" Systems are those systems and sub-systems which, in this master handbook plan, are functionally organized in the Sustained Flight Technical Area, with the exception of Propulsion Systems.

Group "B" Systems are those systems and sub-systems which, in this master handbook plan, are functionally organized in technical areas other than Sustained Flight.

∅ Included here temporarily until issue of the appropriate handbook in the General Base Installations Technical Area.

Aircraft defogging, defrosting,  
deicing and anti-icing  
Aircraft windshield wiping  
Aircraft deceleration (installed)  
Aircraft lighting

Aerial refueling  
Airborne air conditioning, cooling  
and heating  
Airborne pressurizing

HANDBOOK OF INSTRUCTIONS FOR DESIGNERS OF  
PILOTLESS AIRCRAFT AND GUIDED AIRCRAFT ROCKETS

Design guidance for airframes of pilotless aircraft and guided aircraft rockets; relationship to the airframe of Group "A" and Group "B" systems and equipment used in pilotless aircraft and guided aircraft rockets; design guidance for Group "A" systems, such as are indicated in the list below.

The design guidance for other equipment used in pilotless aircraft and guided aircraft rockets is contained in:

Handbook of Instructions for Propulsion Equipment Designers  
Armament Technical Area  
Communication and Navigation Technical Area  
Photographic and Recording Technical Area  
Meteorological Technical Area  
Handbook of Instructions for Aircraft Support Equipment Designers

Flight (unmanned aircraft)  
(airframe design)  
Achieving speed (by airframe)  
Achieving altitude (by airframe)  
Carrying parasites  
Air launched missiles (airframe  
design)  
Protection (armor)  
Aerial towing, coupling  
Aircraft loading and unloading  
(installed)  
Cargo or payload restraint  
Jettisoning  
Ground launched missiles (airframe design)  
Aircraft fire prevention and ex-  
tinguishing  
Aircraft hazard warning  
Aircraft defogging, defrosting,  
deicing, and anti-icing  
Aircraft deceleration (installed)  
Actuation - (airborne) (including electric,  
pneumatic, hydraulic, explosive and  
mechanical systems)

Aircraft alighting (including shock  
absorbing, braking, steering)  
Aircraft stabilizing  
Aircraft instrumentation  
Providing for aircraft visibility  
(windshields, radomes)  
Flight control (systems and  
equipment)  
Aircraft insulating, sound proof-  
ing and padding  
Missile recovery  
/ Launching and catapulting  
/ Arresting  
Carrying and release of external  
stores  
Aircraft auxiliary powering  
Aerial refueling  
Airborne air conditioning, cool-  
ing and heating  
Airborne pressurizing

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/ Included here temporarily until issue of the appropriate handbook in the General  
Base Installations Technical Area.

HANDBOOK OF INSTRUCTIONS FOR PROPULSION EQUIPMENT DESIGNERS

Design guidance for power plants, propellers, and rotary wings for piloted and pilotless aircraft and guided aircraft rockets.

Design guidance for support equipment is in Handbook of Instructions for Aircraft Support Equipment Designers.

Achieving speed (by propulsion)	Airborne purging
Achieving altitude (by propulsion)	Aircraft engine starting
Aircraft assist take-off	Aircraft engine anti-detonant injection
Aircraft engine mounting	Aircraft engine exhaust systems
Aircraft propulsion (engines)	Aircraft engine air intake systems
Aircraft fuel storage and distribution	Rotary wing transmission systems
Aircraft lubrication storage and distribution	Aircraft propulsion (propellers)
Propulsion system control	Aircraft propulsion (rotary wings)

HANDBOOK OF INSTRUCTIONS FOR AIRCRAFT SUPPORT EQUIPMENT DESIGNERS

Design guidance for systems and equipment for repairing, maintaining, testing, over-hauling, assembling, disassembling, handling, and servicing aircraft (including installed systems), together with the peculiar support equipment required for the foregoing items.

Design guidance for launching and arresting equipment is in the Handbook of Instructions for Aircraft Designers and the Handbook of Instructions for Designers of Pilotless Aircraft and Guided Aircraft Rockets.

Towing - hauling	Liquid storing and transferring
Hoisting	Gas storing and transferring
Refueling	Liquified gas storing and transferring
Spraying	Blast deflecting
Jacking and jack manifolding	Protective shielding
Lubricating	Aircraft protective screening
Gas compressing	Electrical generating - aircraft servicing
Gas and liquified gas generating	Testing and maintaining
Flushing and cleaning	Measuring and calibrating (for aircraft and installed systems)
Ventilating and blowing	Covering and protecting
Aircraft material lifting	Ducting
Aircraft material hauling	Aircraft pneumatic lifting
Air conditioning, heating, cooling and dehumidifying	Maintenance shelters
Slinging and spreading	Aircraft weighing
Charging and converting	Power generating - aircraft servicing (electrical, hydraulic, pneumatic, mechanical, and multi-purpose)
Fluid segregating	
Air heating	
Aircraft ground handling	

Aircraft blocking and mooring  
Climbing (ladders)  
Slinging (aircraft components and engines)

Sheltering and housing (stands, shelters)

#### COMMUNICATION AND NAVIGATION TECHNICAL AREA

Design guidance for communications equipment; navigational equipment, except optical; command control equipment; equipment for collecting and/or recording electromagnetic data, except optical; data transmission and relay systems; search, detection, tracking, identification, and height finding equipment, except optical; electronic countermeasure equipment; general purpose test equipment; together with the peculiar support equipment required for the foregoing items.

Design guidance for optical equipment is in the Photographic and Recording Technical Area.

Communication, guidance control,  
    signalling, interphone  
Air and ground based navigation,  
    command control  
Deception, false targets and influences  
    (except non-communications type systems,  
    which are in the General Base Installations Technical Area)  
Rendezvous  
Surprise  
Defensive countermeasures  
Spoofing and jamming  
Missile or weapons guidance  
Target location, identification and marking  
Airborne and ground based identification,  
    detection, warning (including ground observer)  
Communications security

Landing and traffic control  
Station keeping  
Assessment of results - data gathering  
Electronic reconnaissance data gathering and recording  
Electronic reconnaissance analysing  
Visual reconnaissance data recording  
Radar, television, fax, and data transmission and recording  
Illuminant guidance  
Intercept control  
Data relay  
Target seekers  
Command review and display of battle information  
Cryptology

#### ARMAMENT TECHNICAL AREA

Design guidance for fire control and bombing-navigational systems with their associated target locating, tracking, and aiming equipment; together with machine guns, cannon, and free trajectory rockets and their associated mounting, loading, and actuating equipment; peculiar support equipment required for the foregoing.

Design guidance for radar equipment, command control equipment and guidance equipment is in the Communication and Navigation Technical Area.

Airborne guns  
Weapons, nuclear  
Weapons, HE

Airborne weapons, aiming, launching, release



Weapons, BW  
Weapons, CW  
Weapons, psychological warfare  
Weapons, anti-naval  
Air defense (ground)

Target location identification  
(peculiar armament requirements)  
Weapon selection  
Illuminant aiming, launching,  
release

#### PHOTOGRAPHIC AND RECORDING TECHNICAL AREA

Design guidance for cameras, mounts, stabilizers; controls; printing, reproducing and photo-processing equipment; optical equipment for interpretation and analysis of photographs; illumination equipment; together with the peculiar support equipment required for the foregoing items.

Design guidance for electronic type recording equipment is in the Communication and Navigation Technical Area.

Assessment of results - data  
gathering  
Assistance for gathering visual  
reconnaissance data  
Photographing - aerial cameras  
and components  
Camera mounting and stabilizing  
Photo processing (ground and air)  
Photo analysis and interpretation

Photo reproduction  
Photographic illumination  
Aeronautical chart data gathering  
Geodetic information integrating  
Photogrammetric analysis and  
compilation  
Long range collection  
Aeronautical chart reproduction  
Printing and reproducing

#### TRAINING TECHNICAL AREA

Design guidance for training systems and equipment, together with their peculiar support equipment.

Design guidance for trainer aircraft is in the Handbook of Instructions for Aircraft Designers.

Training

#### METEOROLOGICAL TECHNICAL AREA

Design guidance for meteorological systems and equipment, including the relationship between the meteorological and any associated telemetering equipment, together with the peculiar support equipment associated with this equipment.

Design guidance for radar and telemetering equipment is in the Communication and Navigation Technical Area.

Design guidance for optical equipment is in the Photographic and Recording Technical Area.

Weather data gathering and recording (ground)  
Weather reconnaissance data gathering and recording

Weather data analysis  
Wind direction indicating

#### ADMINISTRATION, SUPPLY AND TRANSPORTATION TECHNICAL AREA

Design guidance for systems and equipment for packaging, storing, salvaging, warehousing and materials handling; food handling and preparing; administration (including computers which are not part of flight or armament systems). Design guidance for highway, rail and water transportation, and cross-country pipelines; common installation and maintenance facilities (except for aircraft and for buildings and grounds). Design guidance for peculiar support equipment required for the foregoing.

Design guidance for aerial delivery and clothing (including protective) is in the Rescue, Aerial Delivery and Personal Equipment Technical Area.

Design guidance for photo reproducing equipment is in the Photographic and Recording Technical Area.

Design guidance for installation and maintenance facilities for aircraft are in the Handbook of Instructions for Aircraft Support Equipment Designers.

Design guidance for installation and maintenance facilities for buildings and grounds are in the General Base Installations Technical Area.

Conveying (gravity and power)  
Materials handling  
Ground and air food preparation and serving  
Administration

Providing mobility (cases, bins, platforms, adapters, etc.)

Ground cargo handling, loading and unloading

Salvaging (baling, electromagnetic boists).

Packaging

Personnel boarding and unloading  
Maintenance (common shop tools)  
Weighing (except aircraft)  
Reviewing and displaying of information

Data analysis, collation and comparison

Recording, collating, indexing  
Stock controlling

Stock requirement computing  
Storing

Transporting (except air)

#### RESCUE, AERIAL DELIVERY, AND PERSONAL EQUIPMENT TECHNICAL AREA

Design guidance for systems and equipment for survival, rescue, escape and evasion; clothing and equipage. Peculiar support equipment for the foregoing.

• Parachute repairing  
• Emergency communication and location

Restraining  
Aerial delivery

Survival (kits, boats, rafts,  
parachutes)  
Evasion and escape  
Ground and flight clothing  
Air crew escape  
Ground and flight personnel  
protection (including helmets,  
body armor, masks, protective  
clothing)

/ Air evacuation (medical)  
Crash fire crash rescue (in-  
cluding amphibious and marine)  
Crash marking (land and water)  
Rescue pick-up  
Message and equipment pick-up  
Personal effect carrying (luggage)

#### GENERAL BASE INSTALLATIONS TECHNICAL AREA

Design guidance for systems and equipment for construction, clearing, grading and surfacing; drainage and sewage disposal; air conditioning, heating, ventilating, and refrigerating (except for aircraft servicing). Design guidance for buildings, marine docks, and land transport loading platforms; utilities including community-type water, domestic gas, steam, and electricity generating, processing and distributing equipment and systems. Design guidance for systems and equipment for lighting, marking, and camouflaging. Installation and maintenance equipment for buildings and grounds.

Portable lighting  
Deception (false targets and in-  
fluences) (except communication-  
type systems which are in the  
Communication and Navigation  
Technical Area)  
Camouflage  
Controlling (traffic control towers)  
Airfield lighting and marking  
Lighting and electric power supply  
and distribution (except auxiliary)  
Water supply and distribution  
Gas supply and distribution  
Air raid warning and sheltering  
Decontamination  
Clearing, grading, surfacing roads,  
hardstands, runways

Sewage disposal  
Steam generating and distributing,  
except aircraft servicing  
Docking (marine)  
Air conditioning and ventilating,  
except servicing  
Refrigeration  
Heating except aircraft servicing  
Drainage  
Contamination detection  
Permanent shelter and housing  
(including hangars)  
Installation and maintenance  
(for bases and buildings)  
/ Launching and catapulting  
/ Arresting

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/ Included here temporarily. To be included in the appropriate handbook of the "Medical Technical Area" when published.

/ These two items to be included in the "Handbook of Instructions for Aircraft Designers" and the "Handbook of Instructions for Designers of Pilotless Aircraft and Guided Aircraft Rockets" temporarily, but will be included in the appropriate handbook in this area when it is published.

Erection and hoisting  
Structural fire fighting  
Utility metering  
Distribution and bulk storage  
of liquids

Crash barriers  
Runways, taxiways, berms and  
moorings

### OPERATIONAL SUITABILITY TEST AND

### RESEARCH AND DEVELOPMENT TECHNICAL AREA

Design guidance for common research and development, and operational suitability testing equipment and facilities, together with the peculiar support equipment required for the foregoing items.

Research, development and operational testing (special equipment and facilities)

### MEDICAL TECHNICAL AREA

Design guidance for medical, dental and veterinary systems and equipment.  
Peculiar support equipment.

Medical  
# Air evacuation (medical)

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# This item to be included in the "Rescue, Aerial Delivery and Personnel Equipment Technical Area" temporarily. To be included in the appropriate handbook in this area when published.